

INVITATION FOR BIDS.

**DEPARTMENT OF WATER, COUNTY OF KAUA‘I
JOB 16-04, WATER PLAN 2020 #WKK-03,
MCC, CHLORINATION FACILITIES – KĪLAUEA WELLS NO. 1 AND NO. 2
KAUA‘I, HAWAI‘I**

Pursuant to Chapter 103D, HRS, SEALED TENDERS will be received up to and opened at 2:00 p.m., Hawaiian Standard Time (HST) on Friday, June 5, 2020, in the Administration Office of the Department of Water at 4398 Pua Loke Street, Līhu‘e, Kaua‘i, Hawai‘i (“DOW Admin. Office”). Bids received after the date and time specified above shall be rejected. Facsimile offers will not be accepted or considered.

The schedule set out below represents the Department’s best estimate of the schedule that will be followed for this competitive sealed bidding procurement process. If an activity in the schedule is delayed, the dates following the delayed activity may be adjusted by the same number of days. All prospective Offerors will be advised by addendum of any changes to the Procurement Schedule.

Activity	Scheduled Date
Invitation For Bids Issued	April 24, 2020
Pre-Bid Conference	May 1, 2020 @ 8:30 am HST
Deadline: Receipt of Questions / Comments / Material Substitutions	May 15, 2020
Deadline: Notice of Intent	May 26, 2020
Department’s Responses to Questions / Comments / Material Substitutions	May 26, 2020
Bid Opening	June 5, 2020
Selection / Award Notification	June – July 2020
Contract Execution Period	July – August 2020
Contract Tentative Notice to Proceed Date	September - October 2020

The Manager and Chief Engineer also reserves the right to reject any or all bids, in whole or in part, if deemed to be in the best interest of the Department of Water.

Bids must be signed in ink by the person or persons duly authorized to sign bids in the space provided for signature on the Offer form. **Bidders shall submit their offer and all related documents as required in this solicitation through Public Purchase at www.publicpurchase.com.**

BIDDERS ARE HEREBY NOTIFIED THAT EVIDENCE OF THE AUTHORITY OF THE PERSON(S) SIGNING THE BID DOCUMENT IS REQUIRED TO BE INCLUDED WITH THE BID DOCUMENTS. FAILURE TO COMPLY WITH THIS REQUIREMENT WILL BE CAUSE FOR REJECTION OF THE BID AS BEING NON-RESPONSIVE.

SCOPE OF WORK: The project titled MCC, CHLORINATION FACILITIES, KĪLAUEA WELLS NO. 1 AND NO. 2 (hereinafter referred to as “PROJECT”) consists of furnishing all materials, labor, tools, equipment, and appurtenances required to remove and install a well pump, remove and install a temporary and permanent MCC, demolish and install a new roof and other hardening factors to the existing pump control building, construct a new shelter for the generator, and appurtenant items as specified on the plans and specifications. The work is located at the existing Kīlauea Wells site off Kuawa Road. All work shall be in place complete and in accordance with the plans and specifications.

PLANS AND SPECIFICATIONS: The contract documents are to be downloaded electronically. Please email the Department of Water Departmental Contracts Officer, Christine Ererita at cererita@kauaiwater.org for instructions. May be examined and obtained at the DOW Admin. Office. Those who download documents electronically shall be responsible for any and all costs related to printing or reproducing the items as required for offer submission. For inquires on obtaining plans and specifications and all other inquires call the project engineer at (808) 245-5459.

The contract documents may be examined at the following locations:

DOW Admin. Office, Līhu‘e, Kaua‘i, Hawai‘i
Building Industry Digest Plan Room, Honolulu, Hawai‘i

General Contractors' Association Plan Room, Honolulu, Hawai'i

Published in: The Garden Island Newspaper
Bid Service Weekly
General Contractors' Association
State Procurement Internet website at: <https://hands.ehawaii.gov/hands/welcome>
DOW electronic procurement system at: www.publicpurchase.com
DOW website at: www.kauaiwater.org

CONTRACTORS LICENSE: All prospective Bidders must be currently licensed by the State of Hawai'i, Department of Commerce and Consumer Affairs, Division of Professional and Vocational Licensing.

"A" general engineering contractors and "B" general building contractors are reminded that due to the Hawai'i Supreme Court's January 28, 2002 decision in *Okada Trucking Co., Ltd. v. Board of Water Supply, et al*, 97 Haw. 450 (2002), they are prohibited from undertaking any work, solely or as part of a larger project, which would require the general contractor to act as a specialty contractor in any area where the general contractor has no license. Although the "A" and "B" contractor may still bid on and act as the "prime" contractor on an "A" or "B" project (See, HRS § 444-7 for the definitions of an "A" or "B" project), respectively, the "A" and "B" contractor may only perform work in the areas in which they have the appropriate contractor's license (An "A" or "B" contractor obtains "C" specialty contractor's licenses either on its own or automatically under HAR § 16-77-32.). The remaining work must be performed by appropriately licensed entities. It is the sole responsibility of the contractor to review the requirements of this Project and determine the appropriate licenses that are required to complete the Project.

PRE-BID CONFERENCE: The estimated contract value is more than \$500,000 and thus, a Pre-Bid Conference will be held **via teleconference**. Please contact Christine Erorita at cerorita@kauaiwater.org for the teleconference information. **Due to COVID-19, the project site will be made available on video for viewing. Requests to do 'in-person' site visit must be submitted prior to the Pre-Bid Conference by 2:00 PM HST on April 30, 2020 by email to Christine Erorita at cerorita@kauaiwater.org , and will be scheduled accordingly to comply with social distancing mandated guidelines for May 1, 2020.** All potential interested offerors, subcontractors, and union representatives are invited to attend on the date specified in the Procurement Schedule in Section 1.1 at the DOW Admin. Office. The site inspection is not mandatory; however, submission of an offer shall be evidence that the Offeror understands the scope of the project and shall comply with the specifications herein, if awarded the contract and has thoroughly familiarize itself with the existing conditions, rules and regulations, and the extent and nature of work to be performed. No additional compensation, subsequent to bid opening, shall be allowed by reason of any misunderstanding or error regarding site conditions or work to be performed. All prospective Bidders must make their own transportation arrangements to and from the site. Those interested in attending the pre-bid conference should contact the Procurement Officer. Offerors are advised that anything discussed at the pre-bid conference does not change any part of this solicitation. All changes and/or clarifications to this solicitation shall be done in the form of written addenda.

NOTICE OF INTENTION TO BID: Prospective bidders shall file with the Manager and Chief Engineer, a written notice of intention to bid at least ten (10) calendar days prior to the day designated for the opening of bids, as required by HRS 103D-310.

CHIEF PROCUREMENT OFFICER
DEPARTMENT OF WATER
COUNTY OF KAUA'I

POSTED: April 24, 2020

**INVITATION FOR BIDS
AND
CONSTRUCTION DOCUMENTS
FOR**

**JOB NO. 16-04, Water Plan 2020 #WKK-03
MCC, Chlorination Facilities – Kīlauea Wells No. 1 and
No. 2
KAUA‘I, HAWAI‘I**

April 2020

**DEPARTMENT OF WATER
COUNTY OF KAUA‘I
LĪHU‘E, KAUA‘I, HAWAI‘I**

APPROVED:



Chief Procurement Officer

4-21-20

Date

1 ADMINISTRATION

1.1 INVITATION FOR BIDS.

DEPARTMENT OF WATER, COUNTY OF KAUA'I
Job No. 16-04, Water Plan 2020 #WKK-03 MCC, Chlorination Facilities – Kīlauea Wells No. 1 and No. 2
KAUA'I, HAWAI'I

Pursuant to Chapter 103D, HRS, SEALED TENDERS will be received up to and opened at 2:00 p.m., Hawaiian Standard Time (HST) on **Friday, June 05, 2020**, in the Administration Office of the Department of Water at 4398 Pua Loke Street, Līhu'e, Kaua'i, Hawai'i ("DOW Admin. Office"). Bids received after the date and time specified above shall be rejected. Facsimile offers will not be accepted or considered.

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The Manager and Chief Engineer also reserves the right to reject any or all bids, in whole or in part, if deemed to be in the best interest of the Department of Water.

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BIDDERS ARE HEREBY NOTIFIED THAT EVIDENCE OF THE AUTHORITY OF THE PERSON(S) SIGNING THE BID DOCUMENT IS REQUIRED TO BE INCLUDED WITH THE BID DOCUMENTS. FAILURE TO COMPLY WITH THIS REQUIREMENT WILL BE CAUSE FOR REJECTION OF THE BID AS BEING NON-RESPONSIVE.

SCOPE OF WORK: The project titled MCC, CHLORINATION FACILITIES, KĪLAUEA WELLS NO. 1 AND NO. 2 (hereinafter referred to as "PROJECT") consists of furnishing all Job No. 16-04, Water Plan 2020 #WKK-03 MCC, Chlorination Facilities – Kīlauea Wells No. 1 and No. 2

materials, labor, tools, equipment, and appurtenances required to remove and install a well pump, remove and install a temporary and permanent MCC, demolish and install a new roof and other hardening factors to the existing pump control building, construct a new shelter for the generator, and appurtenant items as specified on the plans and specifications. The work is located at the existing Kīlauea Wells site off Kuawa Road. All work shall be in place complete and in accordance with the plans and specifications.

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CHIEF PROCUREMENT OFFICER
DEPARTMENT OF WATER
COUNTY OF KAUA'I

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1.2 DEFINITIONS.

This section shall incorporate the definitions not listed below and contained in Hawai'i Revised Statutes (HRS) 103D; the Hawai'i Administrative Rules (HAR), Title 3, Department of Accounting & General Services, Subtitle 11, Procurement Policy Board, Chapters 120 through 131; and the General Provisions for Construction Contracts of the Department of Water, dated April 25, 2016. Terms as used in this solicitation, unless the context requires otherwise, shall have the following meaning:

“Award” means the notification of the Department’s acceptance of a bid or the presentation of a contract to the selected offeror.

“Bid sample” means a sample to be furnished by a bidder to show the characteristics of the item offered in the bid.

“Board” or “Board of Water Supply” shall mean the “Department of Water, County of Kaua’i”, as provided for in the County Charter which became effective January 2, 1969.

“Contract Administrator” means the person designated to manage the various facets of the Contract to ensure the Contractor’s total performance is in accordance with the contractual commitments and obligations to the Department are fulfilled.

“Department” or “DOW” means the Department of Water, County of Kaua’i, contracting on behalf of the Board of Water Supply. Wherever the terms “Engineer” or “Owner” are used in any document which forms a part of the Contract, the terms shall mean the Department of Water, County of Kaua’i and its authorized agents.

“Offer” means the bid, proposal, or quotation.

“Offeror” means any individual, partnership, firm, corporation, joint venture, or other legal entity submitting, directly or through a duly authorized representative or agent, an offer for the good, service, or construction contemplated.

“Opening” means the date set for opening of bids, receipt of unpriced technical offers in multistep sealed bidding, or receipt of proposals in competitive sealed proposals.

“Procurement officer” means any person with delegated authority to enter into and administer contracts and make written determination with respect thereto. The term includes an authorized representative acting within the limits of authority. The delegated authority is received from the chief procurement officer directly or through the head of a purchasing agency or designee to the procurement officer.

“Project” means work to be performed as set forth in the Contract, including furnishing all services, labor, goods, materials, supplies, equipment and other incidentals reasonably necessary for the successful completion of work contemplated under the Contract.

“Quotation” means a statement of price, terms of sale, and description of goods, services, or construction offered by a prospective seller to a prospective purchaser, usually for purchases pursuant to section 103D-305, HRS.

“Special Provisions” means the terms and conditions pertaining to the specific solicitation in which they are incorporated; including but not limited to terms and conditions describing the preparation of solicitations, evaluation of offers, determination of award, plus those applicable to performance by the Contractor.

Additions or revisions to the General Provisions, which shall be considered a part of the General Provisions, setting forth conditions or requirements applicable to the particular project or contract under consideration shall be included in the Special Provisions. Should any Special Provisions conflict with these General Provisions, said Special Provisions shall govern.

“Specifications” mean any description of the physical or functional characteristics, or of the nature of a good, service, or construction item. The term includes descriptions or any requirement for inspecting, testing, or preparing a good, service, or construction item for delivery.

“Standard commercial product” means a product or material, in the normal course of business, is customarily maintained in stock or readily available by a manufacturer, distributor, or dealer for the marketing of the product.

“Successful bidder” means the individual, partnership, firm, corporation, joint venture, or other legal entity that submitted a bid for the Project and was determined to be a responsible, responsive bidder and selected for award of the contract.

1.3 INSTRUCTIONS TO BIDDERS.

THESE INSTRUCTIONS TO BIDDERS SHALL BE CONSIDERED TO BE INCORPORATED INTO THE SPECIAL PROVISIONS.

- 1.3.1 Submission of Bids: Bidders shall read and examine the Special Provisions, Specifications, General Provisions and all other bid documents attached hereto and by reference made a part hereof. Submission of bids shall be deemed a verification of such reading and examination and shall be deemed acknowledgement and agreement to be bound by the terms and conditions, and specifications of such documents. All Bidders shall complete and submit with its bid, the Offer form found in Appendix C via www.publicpurchase.com.

All bids for the construction of this project shall be and marked “**16-04, Water Plan 2020 #WKK-03 MCC, Chlorination Facilities – Kilauea Wells No. 1 and No. 2.**”

Bidders shall submit their offer and all related documents as required in this solicitation through Public Purchase at www.publicpurchase.com.

- 1.3.2 Bidding Instructions: In addition to these Instructions to Bidders, Bidders are directed to SECTION 2 - BIDDING / PROPOSAL INSTRUCTIONS of the “GENERAL PROVISIONS FOR CONSTRUCTION CONTRACTS OF THE DEPARTMENT OF WATER”, dated April 25, 2016 (hereafter “GENERAL PROVISIONS”), and the General Provisions in its entirety.
- 1.3.3 Offer Form: The attached form of the OFFER is furnished only for the guidance of bidders and is not to be used for actual bidding. An official copy of the Offer on which the bid shall be made will be furnished to the prospective bidder when plans and specifications are obtained.
- 1.3.4 Omission or Erasures; Conditioned Offers: Any Offer which contains any omission or erasure or alteration not properly initialed or any attempt by a bidder to condition the bid or other irregularity, and bid samples or descriptive literature, unless expressly requested, will not be examined or tested, and will not be deemed to vary any of the provisions of this solicitation and are submitted at the Bidder’s risk and may be rejected. Offerors shall not submit their organization’s terms and conditions, standard contracts, or other similar agreements or forms. General reference to such items or attempts to substitute such items for the Department’s **shall** result in the disqualification of the Offeror’s bid as conditioned.
- 1.3.5 Solicitation Review; Submission of Questions and Requests For Clarification:

- 1.3.5.1 Submission of Questions and Requests for Clarification: Offerors are encouraged to submit written questions pertaining to this solicitation. Questions and requests for clarification must be submitted in writing via e-mail or received by post mail to the Procurement Officer not later than the

date specified in the Procurement Schedule in Section 1.1 in order to generate an official answer. All written questions will receive an official written response from the Department and become an addenda to this solicitation. The only official position of the Department is that which is stated in writing and issued in this solicitation as an addenda thereto. All other means of communication, whether oral or written, shall not be formal or official responses/statements and may not be relied upon.

1.3.5.2 Solicitation Review: Offerors should carefully review this solicitation for defects and/or ambiguities. Comments concerning defects and questionable or objectionable matter must be made in writing either via e-mail or post mailed and should be received by the Procurement Officer not later than the date specified in the Procurement Schedule in Section 1.1. This will allow issuance of any necessary amendments to this solicitation. It will also assist in preventing the opening of offers upon which award may not be made due to a defective solicitation package.

1.3.6 Standard Questionnaire and Financial Statement: When the Manager and Chief Engineer requires a prospective bidder to file a "Standard Qualification Questionnaire for Prospective Offerors on Department of Water Contracts," the prospective bidder shall return a completed Standard Questionnaire, on the form provided by the Department, at least 48 hours prior to opening of bids. If this proves satisfactory, the bidder's Offer will be received.

1.3.7 Bid Bond: A bid bond for the value of 5% of total bid shall accompany the bid.

1.3.8 Performance and Payment Bonds: If the contract which is awarded exceeds \$25,000 and is for construction, performance and payment bonds shall each be in an amount equal to one hundred per cent of the amount of the contract price.

1.3.9 Responsibility of Bidders to Study Site: At the time of opening of bids, the Department shall presume that each Bidder has inspected the project site(s) and has read the Plans, Specifications, and other Contract Documents, including all Addenda and has become thoroughly familiar with them. The failure or omission of any Bidder to receive or examine any form, instrument, or document shall in no way relieve that Bidder from any obligation under the Bid or the Contract.

Each bidder must form an opinion of the character of the work and of the materials to be excavated, from an examination of the project site(s), from studies and inspection of available samples, records and reports and from any other investigations the Bidder may wish to make. Each Bidder must form an independent opinion of all the conditions affecting the work to be done and the labor and materials to be supplied, in order to make a Bid in sole reliance thereupon. Failure of a Bidder to become completely familiar with the labor and construction conditions under which the work is to be performed will not relieve that Bidder of any obligations to furnish all materials, equipment, and labor

necessary to perform the work as set forth in this solicitation and to perform the Contract.

1.3.10 Insurance: Contractor shall procure and maintain, on a primary basis and at its sole expense, at all times during the life of the contract insurance coverages, limits, including endorsements as described Appendix "D" - Insurance, against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work by the Contractor or the Contractor's agents, representatives, employees, or subcontractors. The requirements contained therein, as well as the Department's review or acceptance of insurance maintained by the Contractor is not intended to and shall not in any manner limit or qualify the liabilities or obligations assumed by the Contractor. Unless otherwise approved by the Manager and Chief Engineer, the policy or policies of insurance maintained by the Contractor shall provide the minimum limit(s) and coverage(s) as specified in the attached Appendix "D" - Insurance and be placed with an insurance carrier authorized to do business in this state and rated A-VII by A.M. Best.

1.3.11 Tax Clearance: See: Subsection 3.5 - RESPONSIBILITY OF OFFERORS AND TAX CLEARANCE of the GENERAL PROVISIONS in its entirety. Further, the Bidder shall be required to submit a tax clearance with the bid Offer. Failure to comply with this provision will be grounds for disqualifying the Bidder. The successful bidder will also be required to submit a current valid tax clearance prior to final payment for this Project.

1.3.12 Preferences: The following preferences are applicable when preceded by a checked box. Information and legal and procedural requirements pertaining to all preferences can be found within the General Provisions:

Hawai'i Products Preference (See: Appendix C). Pursuant to HRS 103D-1002, Offers should complete the Certificate of Hawai'i Products Preference for application of this preference.

Reciprocal Preferences: Pursuant to the provisions of Section 103D-1004, HRS and Subchapter 3, Chapter 124, Subtitle 11, Title 3, HAR, the Manager may impose a reciprocal preference against Bidders from those states which apply preferences.

Recycled Products Preference. Pursuant to HRS 103D-1005, Offerors should contact the Procurement Officer for application of this preference.

Tax Payer Preference (Hawai'i Excise and Use Tax Preference). Pursuant to HRS 103D-1008, any "taxpaying bidder" shall qualify for this preference.

Qualified Community Rehabilitation Programs Preference. Pursuant to HRS 103D-1009, a five per cent preference shall be given to services to be provided by nonprofit corporations or public agencies operating qualified community rehabilitation programs in conformance with criteria established by the DLIR for all competitive sealed bid and proposal procurements.

Apprenticeship Program Preference (See: Appendix G). Pursuant to HRS 103-55, applicable to public works projects with estimated values of \$250,000 or greater. Section 103-55.6, HRS, as enacted by S.B. 19, Act 17, SLH 2009, and the State of Hawai‘i Comptroller’s Memorandum 2011-06 as amended, provides for a Hawai‘i Apprenticeship Preference for public works construction projects with estimated values of \$250,000 or greater. The preference shall be in the form of five percent (5%) bid adjustment applied to the Bidder’s Offer amount.

Safety and Health Program (See: Appendix J). Pursuant to HRS 396-18, applicable to construction projects where the offer amount is in excess of \$100,000.

1.3.13 Tax Adjustment for Out-Of-State Vendors and Tax Exempt Bidders: Pursuant to the provisions of Section 103-53.5, HRS, where the Bidder is an out-of-state vendor not doing business in the State of Hawai‘i, or is a person exempted from paying the applicable general excise tax, the package bid or purchase price, for the purpose of determining the lowest price bid, shall be increased by the applicable retail rate of general excise tax and the applicable use tax. The lowest responsible bidder who satisfies all of the requirements of these bid documents, taking into consideration the above increases, shall be awarded the contract, but the contract amount of any contract awarded shall be the amount of the bid offered and shall not include the amount of the increase.

1.3.14 Worker’s Compensation Act: The Contractor will be required to comply with the provisions of Chapter 97, Revised Laws of Hawai‘i 1955, known as the “Worker’s Compensation Laws,” and all laws amendatory thereof, relating to the compensation of employees for personal injuries sustained in the course of their employment. The Contractor’s surety or sureties shall be liable for any loss caused the Department by reason of the Contractor’s failure to comply with the provisions of said laws.

The Contractor shall furnish to the Department one copy of certificate of said insurance prior to commencement of work. Refer to the “RESPONSIBILITY OF SUCCESSFUL BIDDER” for additional requirements.

1.3.15 Subcontractor: Under the terms of this Contract, no subcontractor will be recognized. All subcontractors shall deal directly with the general Contractor; however, each and every subcontractor shall manage and take care of its own material and waste.

1.3.16 Listing Joint Contractors or Subcontractors:

Bidder shall complete the “Joint Contractors or Subcontractors List.” It is the sole responsibility of the bidder to review the requirements of this Project and determine the appropriate specialty contractor licenses that are required to complete the Project.

Bidder shall specify the name of each person or firm to be engaged by the

Bidder as a joint contractor or subcontractor in the performance of the contract and the nature and scope of the work to be performed by each regardless of the percentage of the value of the work to be performed by the joint contractor or subcontractor. (HRS 103D-302(b))

Failure of the Bidder to provide the correct names and specialty contractor's nature of work to be performed may cause the bid to be rejected.

Bidder agrees the completed listing of joint contractors or subcontractors is required for the Project and that Bidder, together with the listed joint contractors and subcontractors, have all the specialty contractor licenses to complete the work.

Based on the Hawai'i Supreme Court's January 28, 2002 decision in Okada Trucking Co., Ltd. v. Board of Water Supply, et al., 97 Hawai'i 450 (2002), the bidder as a general Contractor ('A' or 'B' license) is prohibited from undertaking any work solely or as part of a larger project, which would require the bidder ('A' or 'B' general Contractor) to act as a specialty ('C' license) Contractor in any area in which the bidder ('A' or 'B' general Contractor) has no specialty Contractor's license. Although the 'A' and 'B' Contractor may still bid on and act as the "Prime Contractor" on an 'A' and 'B' project (See: HRS § 444-7 for the definitions of an 'A' and 'B' project.), respectively, the 'A' and 'B' Contractor may only perform work in the areas in which they have the appropriate Contractor's license. The bidder ('A' or 'B' general Contractor) must have the appropriate 'C' specialty Contractor's licenses either obtained on its own, or obtained automatically under HAR §16-77-32.

General Engineering 'A' Contractors automatically have these 'C' specialty contractor licenses: C-3, C-9, C-10, C-17, C-24, C31a, C32, C-35, C-37a, C-37b, C-38, C43, C49, C-56, C-57a, C-57b, and C61.

General Building 'B' Contractors automatically have these 'C' specialty contractor licenses: C-5, C-6, C-10, C-12, C-24, C-25, C31a, C32a, C42a, and C-42b.

1.3.16.1 Instructions to complete the Joint Contractors or Subcontractors List:

1.3.16.1.1 Describe the nature of work to be performed by the specialty contractor for this Project and provide the complete firm name of the joint contractor or subcontractor in the respective columns. If the bidder is a general contractor and providing the work of the required specialty contractor, fill in the Bidder's (general contractor's) name and nature of work to be performed for this Project.

1.3.16.1.2 List only one joint contractor or subcontractor per required specialty contractor classification.

1.3.16.1.3 For projects with alternate(s), fill out the respective “Joint Contractors or Subcontractors List for the Alternate(s).” Bidder shall describe the nature of work to be performed by the specialty contractor on this Project for the respective alternate. Bidders shall fill in the complete firm name and nature of work to be performed by the respective joint contractor or subcontractor. If the joint contractor or subcontractor was previously listed under base bid, listing under Alternate(s) is not required.

1.3.17 Wages and Labor Requirements: Pursuant to HRS Section 103-55, each bidder submitting an offer and list of subcontractors certifies that: **WAGES**: The service to be rendered shall be performed by employees paid not less than wages paid to public officers and employees for similar work; and **COMPLIANCE WITH LABOR LAWS**: All applicable laws of the Federal and State governments relating to workmen’s compensation, unemployment compensation, payment of wages, and safety will be fully complied with. The successful Bidder shall complete the Wage Certification in Appendix E.

1.3.17.1 In accordance with HRS Section 104-2 et seq., the Hawai‘i Director of Labor and Industrial Relations determines the prevailing wages applicable to the project. The wage rates are the minimum rates to be paid and may be revised. Contractors shall pay the applicable rates, as revised, at no cost to the Department. This is not a representation that labor can be obtained at these rates. It is the responsibility of bidders to inform themselves of local labor conditions and prospective changes or adjustments of wage rates. No increase in the contract price shall be allowed or authorized on account of the payment of wage rates in excess of those listed herein. Wage rate schedules are available at the office of the Department of Labor and Industrial Relations, State of Hawai‘i.

Current Wage Rate Bulletin: 496

1.3.18 Asbestos Cement Pipe: For all construction contract bids involving asbestos cement pipe, the Contractor shall remove, handle, and dispose of asbestos cement pipe in conformance with all applicable OSHA, State, and Federal regulations. The asbestos cement pipes shall only be disposed of at an approved disposal site.

1.3.19 Chlorination Subcontractor: All construction contract bids involving any chlorination work shall have a name listed for the C-37d Water Chlorination Subcontractor. Any bid not listing this subcontractor shall be rejected and disqualified.

1.3.20 Substitute Materials: Bidders contemplating submission of bids based on substitute materials must obtain prior written permission from the Department. Lists of substitute materials together with qualifying data shall be submitted on the Department’s Request for Substitution form by the date set in the Procurement Schedule in Section 1.1, as evidenced

by the time stamp of the Department, to the Procurement Officer for approval (the Request for Substitution form may be obtained from this individual). It is not the intent of the Department to exclude or limit the products. Any substitute material determined by the Department upon evaluation to be an acceptable equal, will be listed in an addendum to this solicitation, issued prior to the bid opening date. The Department is the sole judge as to the comparable quality and suitability of any substitute material and its decision shall be final. If a Bidder offers a product without the Department's pre-approval, the substitute material shall not be considered for award.

- 1.3.21 Independent Price Determination: By submitting a bid, the bidder certifies that the price submitted was independently arrived at without collusion.
- 1.3.22 Protests: Any protest shall be submitted in writing within five (5) working days after the posting of the notice of award; provided that a protest based upon the contents of the solicitation shall be submitted in writing prior to the date set for the receipt of offers. Any and all protests pursuant to Hawai'i Procurement Code, Chapter 103D-701 HRS and Section 3-126-3 HAR shall be submitted in writing to the Procurement Officer for this solicitation.
- 1.3.23 Incorporation By Reference: Bidders hereby agree that all documents referred to in the Table of Contents are hereby incorporated by reference into this solicitation.
- 1.3.24 Severability: If any covenant, condition, or provision of this solicitation is held to be invalid by any court of competent jurisdiction, such holding shall not affect the validity of any other covenant, condition, or provision contained herein or incorporated by reference.
- 1.3.25 Remedies; Attorneys Fees, and Costs: All remedies provided in this solicitation shall be deemed cumulative and additional, and not in lieu of or exclusive of each other or of any other remedy available at law or in equity arising hereunder. Should any legal proceedings at law or in equity arise under or in connection with this solicitation, the Contractor shall be responsible for all attorneys' fees and costs (including reasonable fees and charges for the services of paralegals or other personnel who operate for and under the supervision of such attorneys and whose time is usually charged to clients) and any other expenses incurred in connection with such proceedings.
- 1.3.26 Department's Right to Audit: Books and Records: The Contractor shall, at all times during the term hereof, maintain complete and accurate books and records of its operations, including employee time records, in a form consistent with good accounting practice, including such books and records as would normally be examined by an independent certified public accountant in performing an audit or examination of the Contractor's receipts and expenses in accordance with generally accepted auditing standards. The Department has the right to designate an independent auditor to review books and records that specifically relate to this project. Subcontractors shall be bound by the same requirements. See: SECTION 6.9 - CONTROL OF THE CONTRACT of the GENERAL PROVISIONS in its entirety.

- 1.3.27 Confidential Material: All bids are subject to public inspection as set forth in 3-122-30, HAR. Bidders shall request in writing nondisclosure of designated trade secrets or other proprietary data to be confidential. Such data shall accompany the bid and shall be readily separable from the bid in order to facilitate eventual public inspection of the non-confidential portion of the bid. To facilitate the release of the information requested, the Department is prepared to sign a Non-Disclosure Agreement if necessary, however, the Department cannot guarantee that designated data will be kept confidential. The offers are subject to disclosure rules set forth in Chapter 92F, HRS and Non-Disclosure Agreements are enforceable only to the extent that they do not conflict with the provisions of Chapter 92F, HRS. The Bidder bears the burden of establishing that the designated data is exempted from the disclosure requirements set forth in Chapter 92F.
- 1.3.28 Cancellation of the Solicitation and Offer Rejection: The Department reserves the right to cancel this solicitation and to reject any and all offers in whole or in part, and waive any defects, when it is determined to be in the best interest of the Department, pursuant to HAR 3-122-96 and 3-122-97.

The Department shall not be liable for any costs, expense, loss of profit, or damages whatsoever, incurred by the Offeror in the event this solicitation is cancelled or an offer is rejected.

1.4 GENERAL PROVISIONS, SPECIFICATIONS, AND STANDARD DETAILS.

The Special Provisions, plans, General Provisions, Water Standards, County of Kaua'i Department of Public Works ("DPW") Standard Specifications and Details, as amended, contract documents, and all supplemental documents are essential parts of the contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for the complete work. In case of conflict or discrepancy within any part of the contract, the stricter requirements, including Hawai'i State Statutory requirements, shall govern. Unless it is apparent that a different order of precedence is intended, the special provisions shall govern over plans, general provisions, and Water Standards; plans shall govern over general provisions; general provisions shall govern over Water Standards; Water Standards shall govern over DPW Standard Specifications; figured dimensions and drawings take precedence over measurements by scale, and detail drawings; instructions to proposers shall be incorporated and made a part of the special provisions.

It is the responsibility of the prospective offerors, offerors, and Contractors to review the General Provisions, Water Standards, Specifications, and Standard Details and a submission of an offer to this solicitation shall be deemed an acknowledgement of the incorporation of these into this solicitation and the resulting contract, if any.

- 1.4.1 General Provisions for Construction Contracts: The General Provisions for Construction Contracts of the Department of Water, dated April 25, 2016 ("General Provisions") are included in this solicitation. A copy may be found in Appendix "B."

- 1.4.2 Water System Standards. The “Water System Standards”, 2002, as amended, as adopted by the Department of Water, County of Kaua‘i; Board of Water Supply, City and County of Honolulu; Department of Water Supply, County of Maui; Department of Water Supply, County of Hawai‘i (“Water Standards”) is by reference incorporated herein and made a part of these specifications. The Water Standards specifications are not bound in these contract documents, but shall by reference be incorporated herein and made a part hereof.
- 1.4.3 Department of Public Works, County of Kaua‘i Standard Specifications: Whenever reference is made to the DPW Standard Specifications, the specifications referred to is the “HAWAI‘I STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND PUBLIC WORKS CONSTRUCTION” of the State of Hawai‘i, 2005, as amended. These specifications are not bound in the Contract Documents, but shall by reference be incorporated herein and made a part hereof.
- 1.4.4 Department of Public Works, County of Kaua‘i, Standard Details: Whenever reference is made within these Special Provisions or the contract plans to the DPW Standard Details, the Details referred to is the “STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION”, September 1984 and all subsequent amendments. These specifications are not bound in the Contract Documents, but shall by reference be incorporated herein and made a part hereof.

1.5 PROCUREMENT OFFICER AND CONTRACT ADMINISTRATOR.

The Procurement Officer is responsible for administrating/facilitating all requirements of the solicitation process and is the **sole point of contact for Offerors** from the date of release of the solicitation until the selection of the successful Bidder.

The Contract Administrator shall be responsible for the contract administration once the contract is awarded and shall be the point of contact throughout the term of the contract.

If checked, the Procurement Officer and the Contract Administrator shall be the same individual.

The Procurement Officer and Contract Administrator are:

Procurement Officer:

Dustin Moises
 Chief of Construction Management
 Department of Water, County of Kaua‘i
 4398 Pua Loke Street
 Līhu‘e, HI 96766
 Phone Number: 808-245-5459
 enter text.
 Email: dmoises@kauaiwater.org

Contract Administrator:

Click here to enter text.
 Click here to enter text.
 Department of Water, County of Kaua‘i
 4398 Pua Loke Street
 Līhu‘e, HI 96766
 Phone Number: 808-245-Click here to
 enter text.
 Email: Click here to enter text.

2 SCOPE OF WORK

2.1 SCOPE OF WORK.

This Contract consists of the following Scope of Work and includes all other necessary work, all as indicated in the contract drawings and specifications. The general location of the work is as shown on the contract plans and as described herein.

The project titled MCC, CHLORINATION FACILITIES, KĪLAUEA WELLS NO. 1 AND NO. 2 (hereinafter referred to as “PROJECT”) consists of furnishing all materials, labor, tools, equipment, and appurtenances required to remove and install a well pump, remove and install a temporary and permanent MCC, demolish and install a new roof and other hardening factors to the existing pump control building, construct a new shelter for the generator, and appurtenant items as specified on the plans and specifications. The work is located at the existing Kilauea Wells site off Kuawa Road. All work shall be in place complete and in accordance with the plans and specifications.

2.2 TIME OF COMPLETION.

- 2.2.1 It is understood and agreed that the work called for under this Project must and shall be completed within **SIX HUNDRED THIRTY (630) CALENDAR DAYS** after written notice has been given to the Contractor to commence work. No extension of time will be granted for shipping and manufacturer’s delays. The Contractor shall be subject to liquidated damages for delay or nonperformance as stated in this solicitation.
- 2.2.2 Work on the basic contract agreement is to be completed within the stipulated completion time from the date to the “Notice to Proceed.” All work shall be done in co-operation with and coordinated with any other Contractors in a manner to allow completion of the entire construction within the scheduled time.

Per Approved Plans Water Construction Note all materials, shop drawings, chlorination plan, etc. shall be approved by the Department Construction Management Division before a preconstruction meeting can be scheduled. In order for the contractor to meet this requirement, as well as any other requirements related to permitting for the project including but not limited to building, grading, road, noise, demolition, NPDES for staging areas, NPDES duly authorized person designation, etc., the Department has included 90 calendar days for the contractor to complete the process within the total time of completion calendar day amount. Notice to proceed will be given before the contractor begins the project submittal approval process and it is expected that the contractor will complete the submittal and permit process within the 90 calendar day timeframe. No additional days will be granted if the contractor does not complete the process to attain a preconstruction meeting within 90 calendar days.

2.3 PERMITS.

The Contractor shall obtain all necessary permits needed for this job including but not limited

to a Building Permit (Permit No. BP18-00000338), Zoning Permit (Permit No. Z-IV-2018-6), Use Permit (U-2018-5), Special Permit (SP-2018-3), and Well Pump Installation Permits, prior to the commencement of work. The Contractor shall pay for all required charges and fees associated with all applicable permits.

The Contractor shall also file an Application for Community Noise Variance with the Department of Health, State of Hawai'i if necessary. The Contractor shall pay for all required charges and fees associated with this permit.

The Contractor shall obtain any necessary NPDES permits from the Department of Health, State of Hawai'i and all necessary Department of Army permits and/or Federal permits prior to the commencement of work. The Contractor shall pay for all required charges and fees associated with these permits. No time extension will be granted for the Contractor's inability to obtain NPDES permits. The Contractor shall pay for all required charges and fees associated with all applicable NPDES permits.

Note: The Consultant has confirmed per the disturbed area shown on the construction drawings that the total area of disturbance for this project is below the requirement for NPDES NOI-C for storm water discharge.

2.4 CONTRACTOR'S RESPONSIBILITY FOR EXISTING UTILITIES AND STRUCTURES.

The existence and location of underground utilities and structures as shown on the plans are from the best information available but are not guaranteed and other obstacles may be encountered in the course of the work. Prior to the start of excavation, the Contractor shall contact all utility companies and have them locate their respective lines affected. The Contractor shall be held responsible for any damage to and for the maintenance and protection of existing utilities and structures. See: SECTION 6 - PERFORMANCE OF CONTRACT of the GENERAL PROVISIONS in its entirety.

2.5 POWER AND WATER SUPPLIES.

The Contractor shall make all the necessary arrangements and installation work that may be required for power and water supplies for the work under this Contract. Cost for said power and water supplies shall be included in appropriate unit prices bid and no direct payment will be made therefore.

2.6 CONTRACTORS LICENSE REQUIRED.

The Department shall reject all bids received from contractors who are not licensed by the State Contractors License Board in accordance with Chapter 444, Hawai'i Revised Statutes. It is the sole responsibility of the Bidder to review the requirements of this Project and determine the appropriate licenses that are required to complete the Project.

2.7 HOURS.

No work shall be done on Saturdays, Sundays, legal State Holidays and/or in excess of eight (8) hours each day without the written consent of the Contract Administrator. Should permission be granted to work at such times, the Contractor shall pay for all inspectional and administrative costs thereof. No work shall be done at night unless authorized by the Contract Administrator. No work shall be done at night during seabird fallout season (September 15 – December 15, annually). See: SECTION 6.9 and 6.12 of the GENERAL PROVISIONS.

2.8 QUANTITIES.

All bids will be compared on the basis of quantities of work to be done, as shown in the bid; the quantities shown in the Unit Price items are estimated, being given as a basis for comparison of bids. The Department reserves the right to increase or decrease the quantities or delete items entirely as may be required during the progress of the work. See: SECTION 7.2 and 7.3 of the GENERAL PROVISIONS.

2.9 MATERIALS FURNISHED FOR THE PROJECT.

All materials necessary for the completion of the project shall be furnished by the Contractor, unless specifically stated otherwise and full compensation thereof shall be included in the various items in the bid. All materials for this Project shall be ordered after the notice to proceed is issued and the shop drawings, if applicable, have been approved by the Department.

2.10 WORK TO BE DONE WITHOUT DIRECT PAYMENT.

Whenever it is specified in the contract that the Contractor is to do work or furnish materials of any kind for which no price is fixed in the contract, it shall be understood that such work or furnishing such materials was included in a unit price for the appropriate item, unless it is expressly specified that such work or material is to be paid for as extra work.

2.11 INTENT OF THE SPECIFICATIONS.

It is not the intent of the Department to limit Proposers to these specifications; however, the specifications designated as “requirements” contained herein are the minimum acceptable.

2.12 IMPLEMENTATION.

The Contractor will be required to:

2.12.1 Provide required permits for the construction of this Project, trained construction crew and project management necessary to ensure a complete constructed and fully functional water facilities as specified in this solicitation.

2.12.2 Provide all documentation, including all warranties and certification documents, on the construction materials being used.

2.13 GOVERNING LAW; APPLICATION OF LAW.

This solicitation and the Contract awarded based on such solicitation shall be governed by the laws of the State of Hawai‘i. The Contractor shall comply with all federal, State and local laws, regulations and ordinances, including occupational safety and health standards applicable to the performance of the services specified.

3 METHOD OF AWARD

3.1 METHOD OF AWARD.

- 3.1.1 Award, if made, shall be to the responsive, responsible Offeror submitting the lowest Total Sum Bid price.
- 3.1.2 Only those offers that meet all of the solicitation specifications, General Provisions, Special Provisions, and any other requirement contained herein will be considered for award. Any offer that proposes terms, conditions, or requirements that are contrary to those specified herein or does not meet the qualification requirements of this solicitation, as solely determined by the Department and as provided herein, may be considered nonresponsive and will be rejected as provided herein.

3.2 HAWAI'I REVISED STATUTES.

The Contractor's attention is called to the following chapters within the HRS which affect this Contract and the performance thereof:

Chapter 103, relating to expenditure of public money;
Chapter 104, relating to wages and hours of employees on public works;
Chapter 376, relating to industrial safety;
Chapter 386, relating to workmen's compensation;
Chapter 321, relating to the Health Department;
Section 507-17, relating to recovery on bond for material and labor used on public works; and
Chapter 378, relating to fair employment practices

3.3 RESPONSIBILITY OF SUCCESSFUL BIDDER.

- 3.3.1 The successful Bidder is advised that it shall, immediately prior to award of the contract, furnish proof of compliance with the requirements of HAR §3-122-112, to wit: Chapter 237, tax clearance; Chapter 383, unemployment insurance; Chapter 386, workers' compensation; Chapter 392, temporary disability insurance; Chapter 393, prepaid health care; and one of the following: a) Be registered and incorporated or organized under the laws of the State (hereinafter referred to as a "Hawai'i business"); or b) Be registered to do business in the State (hereinafter referred to as a "compliant non-Hawai'i business."
- 3.3.2 To comply with these requirements, the successful Bidder shall produce the following documents to the Department to demonstrate compliance with this section.

3.3.2.1 HRS Chapter 237 Tax Clearance Requirement for Award and Final Payment. Instructions are as follows:

Pursuant to HRS §103D-328, successful Bidder shall be required to submit a tax clearance certificate issued by the Hawai'i State Department of

Taxation (“DOTAX”) and the U.S. Internal Revenue Service (“IRS”). The certificate is valid for six (6) months from the most recent approval stamp date on the certificate and must be valid on the date it is received by the Department of Water.

The tax clearance certificate shall be obtained on the State of Hawai‘i, DOT TAX CLEARANCE APPLICATION Form A-6 (Rev. 2003) which is available at the DOTAX and IRS offices in the State of Hawai‘i or the DOTAX website and by mail or fax:

DOTAX Website (forms & Information):
<http://www.state.hi.us/tax/alphalist.html#a>
DOTAX Forms by Fax/Mail: (808) 587-7572 / 1-800-222-7572

Completed tax clearance applications may be mailed, faxed or submitted in person to the Department of Taxation, Taxpayer Services Branch, to the address listed on the application.

DOTAX (fax): (808) 587-1488
IRS (fax): (808) 539-1573

The application for the clearance is the responsibility of the Bidder and must be submitted directly to the DOTAX or IRS and not to the Department of Water.

3.3.3 HRS Chapters 383 (Unemployment Insurance), 386 (Workers’ Compensation), 392 (Temporary Disability Insurance), and 393 (Prepaid Health Care) Requirements for Award. Instructions are as follows:

Pursuant to HRS §103D-310, the successful Bidder shall be required to submit an approved certificate of compliance issued by the Hawai‘i State Department of Labor and Industrial Relations (“DLIR”). The certificate is valid for six (6) months from the date of issue and must be valid on the date it is received by the Department.

The certificate of compliance shall be obtained on the State of Hawai‘i, DLIR APPLICATION FOR CERTIFICATE OF COMPLIANCE WITH SECTION 3-122-112, HAR, Form LIR#27 which is available at www.dlir.state.hi.us/LIR#27, or at the neighbor island DLIR District Offices. The DLIR will return the form to the Bidder who in turn shall submit it to the Department.

The application for the certificate is the responsibility of the Bidder and must be submitted directly to the DLIR and not to the Department of Water.

3.4 REQUIREMENT FOR AWARD.

To be eligible for award, the Bidder must comply as follows:

- 3.4.1 Hawai'i Business. A business entity referred to as a "Hawai'i business" is registered and incorporated or organized under the laws of the State of Hawai'i. As evidence of compliance, Bidder shall submit a CERTIFICATE OF GOOD STANDING issued by the State of Hawai'i Department of Commerce and Consumer Affairs Business Registration Division ("BREG"). A Hawai'i business that is a sole proprietorship, however, is not required to register with the BREG and therefore not required to submit the certificate. A Bidder's status as sole proprietor or other business entity and its business street address indicated on the OFFER form will be used to confirm that the Bidder is a Hawai'i business.
- 3.4.2 Compliant Non-Hawai'i Business. A business entity referred to as a "compliant non-Hawai'i business" is not incorporated or organized under the laws of the State of Hawai'i but is registered to do business in the State of Hawai'i. As evidence of compliance, Bidder shall submit a CERTIFICATE OF GOOD STANDING.

To obtain a CERTIFICATE OF GOOD STANDING go online to www.BusinessRegistrations.com and follow the prompt instructions. To register or to obtain a "Certificate of Good Standing" by phone, call (808) 586-2727 (M-F 7:45 to 4:30 HST). The "Certificate of Good Standing" is valid for six months from date of issue and must be valid on the date it is received by the Department.

- 3.4.3 Registration Costs. Bidders are advised that there are costs associated with registering and obtaining a "Certificate of Good Standing" from the DCCA.

3.5 TIMELY SUBMISSION OF ALL CERTIFICATES.

- 3.5.1 The certificates described in this section should be applied for and submitted to the Department as soon as possible after the Department notifies the successful Bidder that the Department intends to issue an award to the successful Bidder. If valid certificates are not submitted within **ten (10) calendar days** after the Department so notifies the successful bidder, the successful Bidder's offer may be disqualified and any prospective award (or actual award if mistakenly issued), even though the successful bidder's bid is otherwise responsive and responsible, may be canceled without any liability whatsoever to the Department. The Department, and not the successful bidder, shall determine whether all necessary certificates have been timely submitted.
- 3.5.2 If the Department cancels any prospective or actual award for failure to submit all required certificates, the Department reserves the right to make an award to the next lowest responsive and responsible Bidder who is able to submit all the required certificates.

3.6 FINAL PAYMENT REQUIREMENTS.

Contractor is also required to submit a tax clearance certificate for final payment on the contract. A tax clearance certificate, not over two months old, with an original green certified copy stamp, must accompany the invoice for final payment on the contract. In

addition to a tax clearance certificate, an original “Certification of Compliance for Final Payment” (SPO Form-22), will be required for final payment. This form is attached hereto as Appendix F.

4 AWARD OF CONTRACT AND NOTICE TO PROCEED

4.1 AWARD.

The successful Bidder shall comply with SECTION 3 - AWARD AND EXECUTION OF CONTRACT of the GENERAL PROVISIONS in its entirety.

4.2 NOTICE OF AWARD.

The Procurement Officer will inform the successful Bidder of contract award selection within 48 hours of confirmation. Additionally, an official contract award notification letter will be executed by the Department and provided at the earliest date.

4.3 NOTICE TO PROCEED.

Upon contract execution, a "Notice to Proceed" letter will be provided to the Contractor specifying the "Commencement" (start work) date of the Contract. No work is to be undertaken by the Contractor prior to the commencement date specified in the Notice to Proceed letter. The Department is not liable for any work, contract, costs, expenses, loss of profits, or any damages whatsoever incurred by the Contractor prior to the official Notice to Proceed "Commencement" date.

APPENDIX A: Sample Contract.

(Bound separately).

APPENDIX B: General Provisions for Construction Contracts for the Department of Water, dated April 25, 2016 (bound separately).

APPENDIX C: Offer.

Contractor _____

OFFER

For

DEPARTMENT OF WATER, COUNTY OF KAUA'I,
LĪHU'E, KAUA'I, HAWAI'I

_____ 20 _____

Chief Procurement Officer
Department of Water
County of Kaua'i
4398 Pua Loke Street
Līhu'e, Hawai'i 96766

Dear Sir:

Pursuant to and in compliance with your Invitation For Bids and other Contract Documents relating thereto, the undersigned Offeror, having familiarized itself with the terms of the contract, the local conditions affecting the performance of the contract and the cost of the work at the place where the work is done, the plans and specifications, "General Provisions for Construction Contracts of the Department of Water", "Water System Standards, 2002", Invitation For Bids, and other Contract Documents, hereby proposes and agrees to perform, within the time stipulated in the said documents, including all its component parts and everything required to be performed, and to provide and furnish any and all of the labor, materials, tools, expendable equipment, and all utility and transportation services necessary to perform the contract, in a workmanlike manner, in place complete all of the work covered by the contract in connection with these specifications and accompanying construction plans titled:

JOB NO. 16-04, Water Plan 2020 #WKK-03 MCC, Chlorination Facilities – Kīlauea Wells No. 1 and No. 2, KAUA'I, HAWAI'I

on file in the office of the Department of Water for,

TOTAL SUM OFFER _____ DOLLARS
(words)

(\$ _____) said total sums being itemized on the following pages:

OFFER SCHEDULE

JOB NO. 16-04, Water Plan 2020 #WKK-03 MCC, Chlorination Facilities – Kīlauea Wells No. 1 and No. 2, KAUA‘I, HAWAI‘I

ITEM NO.	ESTIMATED QUANTITY		DESCRIPTION	UNIT PRICE	TOTAL
			SPECIAL PROVISIONS SECTION SP-5 – STRUCTURAL		
1	1	LS	Generator shelter concrete work, including but not limited to: preparation of subgrade, base course, formwork, reinforcing steel and concrete for the generator shelter foundation, generator shelter roof, and equipment pads, inclusive of all appurtenances and incidentals, in place complete.		\$
2	1	LS	Existing control building concrete work, including but not limited to: formwork, reinforcing steel, and concrete for the control building new roof, inclusive of all appurtenances and incidentals, in place complete.		\$
3	1	LS	Concrete Unit Masonry, including but not limited to: unit masonry, reinforcing steel, and grout for the generator shelter, inclusive of all appurtenances and incidentals, in place complete.		\$
4	1	LS	Concrete Unit Masonry, including but not limited to: unit masonry, reinforcing steel, and grout for the control building, inclusive of appurtenances and incidentals, in place complete.		\$
5	1	LS	Miscellaneous metalwork, to include the following items, inclusive of all appurtenances and incidentals, in place complete. <ul style="list-style-type: none"> ▪ Anchorage requirements for the generator shelter and all equipment, including but not limited to: anchors, grout, repair, mortar, and adhesives. ▪ Steel bollards (qty. 3) for the generator shelter, including but not limited to: concrete, reinforcement, flanges, and painting, in place complete. 		\$
			SPECIAL PROVISIONS SECTION SP-6 –ARCHITECTURAL		

ITEM NO.	ESTIMATED QUANTITY		DESCRIPTION	UNIT PRICE	TOTAL
6	1	LS	Control building architectural work, to include the following items, inclusive of all appurtenances and incidentals, in place complete. <ul style="list-style-type: none"> ▪ Demolition and disposal of existing wood and tile roof ▪ Demolition of existing wooden wall panel and vent ▪ Installation of new fluid-applied elastomeric roofing ▪ Installation of new gutters and downspout with splashblocks ▪ Installation of new hurricane-rated metal shutters by licensed dealer ▪ Replacement of existing doors with hurricane-rated metal doors and hardware 		\$
7	1	LS	Generator shelter architectural work, to include the following items, inclusive of all appurtenances and incidentals, in place complete. <ul style="list-style-type: none"> ▪ Fluid-applied elastomeric roofing ▪ Louvers, including but not limited to: hardware and caulking. ▪ Metal door, including but not limited to: framing and finish hardware. ▪ Coiling doors, including but not limited to: framing, finish hardware, and operator. ▪ Metal drip pan 		\$
8	1	LS	Generator shelter and control building extension interior and exterior painting and coating, including but not limited to: surface preparation, priming, paint or coating, caulking, sealants, and all appurtenances and incidentals, in place complete.		\$
			SPECIAL PROVISIONS SECTION SP-7 – MECHANICAL		
9	1	LS	Generator exhaust system, including but not limited to: piping, hoses, valves, fittings, supports, wall thimbles, quick disconnect system, reinforcement, and testing, inclusive of all appurtenances and incidentals, in place complete.		\$
10	1	LS	Fire extinguisher, including but not limited to: mounting brackets and nameplates, inclusive of		\$

ITEM NO.	ESTIMATED QUANTITY		DESCRIPTION	UNIT PRICE	TOTAL
			all appurtenances and incidentals, in place complete.		
11	1	LS	<p>Pump No. 2 replacement, to include the following items, inclusive of all appurtenances and incidentals, in place complete.</p> <ul style="list-style-type: none"> ▪ Demolition and disposal of existing pump system, including but not limited to: existing pump, motor, discharge column, discharge head, flange adapter, and all associated appurtenances. ▪ Furnishing and installation of new pump system, including but not limited to: new pump, motor, discharge head, discharge column, pump and piping adapters, hoses, sole plate, and all other appurtenances. ▪ Reconnection and testing of existing air valve, pre-lube system, and all associated appurtenances. ▪ Hydrotesting, cleaning, and commissioning of new pump system. 		\$
			SPECIAL PROVISIONS SECTION SP-8 – ELECTRICAL		
12	1	LS	<p>Demolition, to include the following items, inclusive of all appurtenances and incidentals, in place complete.</p> <ul style="list-style-type: none"> ▪ Demolition and removal of existing electrical service equipment, including main service panelboard, surge arrester, CT cabinet, meter sockets, pull box, and associated conduit and wiring. Coordination with KIUC for removal of meter and CTs. ▪ Removal of existing service conductors from the KIUC transformer abandonment of existing ductbank in place. Coordination with KIUC for determination and removal of conductors. ▪ Demolition and removal of existing motor control center (MCC) in the well pump control building, including all associated wiring and components. Modification of existing concrete equipment pad for the MCC. ▪ Demolition and removal of existing power 		\$

ITEM NO.	ESTIMATED QUANTITY		DESCRIPTION	UNIT PRICE	TOTAL
			<p>factor correction capacitors and capacitor disconnects, including conduit and wiring.</p> <ul style="list-style-type: none"> ▪ Demolition and removal of existing secondary MCC lineup, including associated components and wiring. ▪ Demolition and removal of existing interior and exterior light fixtures at the control building, including associated conduit and wiring. ▪ Demolition and removal of existing door security switches and associated junction boxes, conduits, and wiring. ▪ Demolition and removal of existing signal wiring and exposed conduits for well level and well flow signals to RTU 82. ▪ Demolition and removal of existing pump disconnect switch, junction boxes, flexible conduit, and wiring at Well Pumps 1 and 2, exclusive of items associated with discharge pressure transmitters and discharge flow meters. Demolition and removal of existing conduit stub-ups at Well Pumps 1 and 2. Abandonment of existing Pump 1 power and control ductbank in place. 		
13	1	LS	<p>Provision of temporary electrical system, inclusive of all appurtenances and incidentals, in place complete:</p> <ul style="list-style-type: none"> ▪ Temporary MCC in outdoor enclosure, including all components, wiring, and concrete equipment pad. ▪ Modification of existing main service panelboard to feed temporary equipment. ▪ Temporary transfer of existing building 120V loads to Panel PNL-A. ▪ Temporary SCADA connections. ▪ All temporary conduit and wiring to feed existing equipment. ▪ Removal and salvage of temporary MCC to DOW's Lihue Baseyard; demolition of temporary MCC concrete pad. ▪ Removal of all temporary conduit and wiring (where not remaining as part of the permanent system). 		\$

ITEM NO.	ESTIMATED QUANTITY		DESCRIPTION	UNIT PRICE	TOTAL
14	1	LS	Provision of new generator building electrical system, inclusive of all appurtenances and incidentals, in place complete: <ul style="list-style-type: none"> ▪ Electrical service equipment, including main panelboard, CT cabinet, meter socket, and pullbox. Coordination with KIUC to install meter socket, CTs, and wiring. ▪ Panelboard PNL-B. ▪ Generator terminal box. ▪ Building lighting and receptacles. ▪ Building door security system. ▪ Building grounding system. ▪ All new conduit and wiring. 		\$
15	1	LS	Provision of all new electrical ductbanks at the site, including conduit and wiring, inclusive of all appurtenances and incidentals, in place complete: <ul style="list-style-type: none"> ▪ Electrical service ductbank from the KIUC transformer to the new service equipment at the generator building. ▪ Ductbank between generator shelter and well pump control building. ▪ Ductbank to Well Pump 1. ▪ Tie-in to existing Well Pump 2 ductbank. 		\$
16	1	LS	Provision of new electrical equipment at the well pump control building, inclusive of all appurtenances and incidentals, in place complete: <ul style="list-style-type: none"> ▪ Well pump MCC, including all components and wiring. ▪ Panel PNL-A. SCADA termination cabinet, including terminal blocks. ▪ Disconnect switches for two chlorine booster pumps. ▪ Building lighting and receptacles. ▪ Building grounding system. ▪ Door security switches. ▪ All new conduit and wiring. 		\$
17	1	LS	Electrical work at Pump No. 1, inclusive of all appurtenances and incidentals, in place complete: <ul style="list-style-type: none"> ▪ Fused disconnect switch. ▪ All junction boxes, conduit, and wiring, including new conduit stub-ups at the pump area. 		\$

ITEM NO.	ESTIMATED QUANTITY		DESCRIPTION	UNIT PRICE	TOTAL
18	1	LS	Electrical work at Pump No. 2, inclusive of all appurtenances and incidentals, in place complete: <ul style="list-style-type: none"> ▪ Fused disconnect switch. ▪ All junction boxes, conduit, and wiring, including new conduit stub-ups at the pump area. 		\$
19	1	LS	Connections to existing SCADA RTU 82, including wiring from SCADA termination cabinet, inclusive of all appurtenances and incidentals, in place complete.		\$
20	1	LS	All startup and testing for electrical equipment, inclusive of all appurtenances and incidentals.		\$
21	1	LS	Performance of a short-circuit study, coordination study, and arc flash hazard analysis in accordance with the Special Provisions, inclusive of the following: <ul style="list-style-type: none"> ▪ Preliminary report compiling and summarizing the results of the various studies for verification of equipment ratings and settings prior to ordering. ▪ Final report compiling and summarizing the results of the various studies verifying the results of the preliminary report and incorporating any changes through completion of startup and testing. 		\$
22	1	AL	Allowances: <ul style="list-style-type: none"> ▪ All fees from Kauai Island Utility Cooperative (KIUC) for materials and work performed by KIUC in support of the installation of the new electrical service 		\$ 25,000.00
			SPECIAL PROVISIONS SECTION SP-9 - CIVIL WORK		
23	1	LS	Site preparation to include the following items, inclusive of all appurtenances and incidentals, in place complete. <ul style="list-style-type: none"> ▪ Erosion and sediment control, to include the furnishing, installation, and maintenance of silt fences, construction ingress and egress, and dust control. ▪ Clearing and grubbing to include the removal, hauling, and disposal of all shrubs, 		\$

ITEM NO.	ESTIMATED QUANTITY		DESCRIPTION	UNIT PRICE	TOTAL
			bushes, and plants within limits of project area. <ul style="list-style-type: none"> ▪ Excavation and earthwork for new site work and new generator building foundation to include excavation, stockpiling, and storage of earthwork ▪ Demolition, removal, hauling, and disposal of all existing asphalt concrete pavement, including all appurtenances and incidentals in place complete 		
24	1	LS	New site work, to include the following items, inclusive of all appurtenances and incidentals, in place complete. <ul style="list-style-type: none"> ▪ Asphalt concrete pavement: Furnish and install all materials needed for asphaltic concrete pavement to include preparation of subgrade, aggregate base course, asphaltic concrete, and tack coat. ▪ Concrete headers and curbs: Furnish and install all materials needed for concrete headers and curbs, included but not limited to preparation of subgrade, base course, formwork, concrete, and reinforcement. ▪ Steel bollards: Furnish and install all materials needed for preparation of subgrade, base course, concrete footings, pipe steel bollards, and painting. 		\$
25	1	LS	Grading and site restoration, including but not limited to: earthwork, hydromulching, grassing, irrigation, and maintenance until establishment is complete, and all appurtenances and incidentals, in place complete.		\$
26	1	AL	Allowances <ul style="list-style-type: none"> ▪ Relocation of unknown utilities 		\$ 10,000.00
			SPECIAL PROVISIONS SECTION SP-10 – GEOTECHNICAL WORK		
27	1	LS	Geotechnical monitoring and testing, including but not limited to: retaining of a third-party geotechnical engineer for monitoring of earthwork activities, sieve testing of aggregates and materials, compaction and fill testing and reports, and all appurtenances and incidentals, in place complete.		\$

ITEM NO.	ESTIMATED QUANTITY		DESCRIPTION	UNIT PRICE	TOTAL
			TOTAL SUM OFFER (Items 1 to 27 inclusive)		\$

SCHEDULE B
HAWAI'I PRODUCTS PREFERENCE

In accordance with HRS §103D-1002, the Hawai'i products preference is applicable to this solicitation. Hawai'i Products ("HP") are available for those items noted on Schedule B, below. The Hawai'i products list is available on the SPO webpage at www.spo.hawaii.gov/for-state-county-personnel/manual/procurement/solicitation/goods-services-construction/preferences/hawaii-product-preferences/ or go to the SPO Home page, click on "For Vendors" tab; click on Preferences, Hawai'i Product Preferences to view. Offeror transmitting a Hawai'i Product (HP) shall identify the HP on Schedule B-1.

Any person desiring a Hawai'i product preference shall have the product(s) certified and qualified if not currently on the Hawai'i products list, prior to the deadline for receipt of offer(s) specified in the procurement notice and solicitation. The responsibility for certification and qualification shall rest upon the person requesting the preference. Persons desiring to qualify their product(s) not currently on the Hawai'i product list shall complete form SPO-038, Certification for Hawai'i Product Preference and submit, via email to the Procurement Officer issuing the solicitation, and provide the solicitation number and title in the subject line, and include all additional information required by the Procurement Officer. For each product, one form shall be completed and transmitted (i.e. 3 products should have 3 separate forms completed). Form SPO-038 is available on the SPO webpage at <http://hawaii.gov/spo> under the 'Quicklinks' menu; click on 'Forms for Vendors, Contractors, and Service Providers'.

When a solicitation contains both HP and non-HP, then for the purpose of selecting the lowest bid or purchase price only, the price offered for a HP item shall be decreased by subtracting 10% for the class I or 15% for the class II HP items offered, respectively. The lowest total offer, taking the preference into consideration, shall be awarded the contract unless the offer provides for additional award criteria. The contract amount of any contract awarded, however, shall be the amount of the price offered, exclusive of the preferences.

Change in Availability of Hawai'i product. In the event of any change that materially alters the Offeror's ability to supply Hawai'i products, the Offeror shall notify the Procurement Officer in writing no later than five (5) working days from when the Offeror knows of the change and the parties shall enter into discussions for the purposes of revising the contract or terminating the contract for convenience.

The following is a list of products that the Department anticipates will be used in this particular project; however the list is not all inclusive and additional products may be qualified.

HAWAI'I PRODUCTS LIST

HP Description	Manufacturer/Supplier	Class
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Bidders intending to use or supply a Hawai'i Product must list the price and total cost of each item f.o.b. jobsite, unloaded, including applicable general excise tax and use tax on this form. Failure to designate a Hawai'i product will mean that the Bidder is offering a non-Hawai'i product and award, if made to the bidder, will be on the basis that the bidder will deliver or use a non-Hawai'i product.

The Bidder shall list only the Manufacturers/Suppliers certified and qualified on Schedule B.

If the Department has awarded a contract under HRS, § 103D-1002, finds that in the performance of that contract there has been a failure to comply with HRS, § 103D-1002, the contract shall be voidable and the findings shall be referred for debarment or suspension proceedings under HRS 103D-702. Any purchase made or any contract awarded or executed in violation of this section shall be void and no payment shall be made by the Department on account of the purchase or contract.

SCHEDULE B-1
SCHEDULE OF MATERIAL COST
(if Hawai'i preference requested)

HAWAI'I PRODUCT	MANUFACTURER	CLASS	APPROX. QUANTITY	UNIT	TOTAL COST OF MATERIAL
Aggregates and Sand – Basalt, rock, cinder, limestone and coral					
Aggregates – Recycled asphalt and concrete					
Asphalt and paving materials					
Cement and concrete products					
Pre-cast concrete products					
Signs–traffic, regulatory and construction					
Soil amendments, mulch, compost					

SCHEDULE C
MANDATORY LICENSING REQUIREMENT

“A” general engineering contractors and “B” general building contractors are reminded that due to the Hawai‘i Supreme Court’s January 28, 2002 decision in Okada Trucking Co., Ltd. V. Board of Water Supply, et al., 97 Haw. 450 (2002), they are prohibited from undertaking any work, solely or as part of a larger project, that would require the general contractor to act as a specialty contractor in any area in which the general contractor has no license. Although the “A” and “B” contractor may still submit an offer on and act as the “prime” contractor on an “A” and “B” project (*See, HRS § 444-7 for the definitions of an “A” and “B” project.*), respectively, the “A” and “B” contractor may only perform work in the areas in which they have the appropriate “C” specialty contractor’s license (*An “A” or “B” contractor obtains “C” specialty contractor’s licenses either on its own, or automatically under HAR § 16-77-32.*). The remaining work must be subcontracted out to appropriately licensed “C” specialty contractors. It is the sole responsibility of the contractor to review the requirements of this project and determine the appropriate licenses that are required to complete the project.

LISTING OF SUBCONTRACTORS

Sec. 103D-302, H.R.S., provides that each offer for Public Works Construction Contracts shall include the name of each person or firm to be engaged by the Offeror as a joint contractor or subcontractor in the performance of the Public Works Construction Contract. The Offer shall also indicate the nature and scope of the work to be performed by such joint contractors or subcontractors. All offers which do not comply with this requirement shall be rejected pursuant to Sec. 103D-302(b) H.R.S.

To comply with the above provisions, the offeror shall complete the schedule of the nature and scope of work by listing, where applicable, the names of the joint contractors and subcontractors to be used after the description of the nature and scope of the work.

ALL JOINT CONTRACTORS OR SUBCONTRACTORS TO BE ENGAGED ON THIS PROJECT

The Offeror certifies that the following is a complete listing of all joint contractors and/or subcontractors who will be engaged by the Offeror on this Project to perform the nature and scope of work indicated **regardless of the percentage of the value of the work to be performed by the joint contractor or subcontractor**, pursuant to Section 103D-302, Hawai‘i Revised Statutes, and understands that failure to comply with this requirement shall be just cause for rejection of the Offer.

The Offeror further understands that only those joint contractors or subcontractors listed shall be allowed to perform work on this Project. If no joint contractor or subcontractor for any subdivision of work is listed, it shall be construed that the work shall be performed by the Offeror with Offeror’s employees.

All Offerors must be sure that they possess, and that the joint contractors or subcontractors listed in the Offer possess, all the necessary specialty licenses needed to perform the work for this Project. The Offeror shall be solely responsible for assuring that all specialty licenses required to perform the work is covered in the Offer.

The Offeror shall include the license number of the joint contractors or subcontractors listed below. Failure to provide the correct names and license numbers as registered with the Contractors Licensing Board may cause rejection of the offer submitted.

It is the sole responsibility of the contractor to review the requirements of this Project and determine the appropriate licenses that are required to complete the Project.

LISTING OF ALL JOINT CONTRACTORS OR SUBCONTRACTORS

	Contractor Classification	Name of Joint Contractor or Subcontractor	License Number
C-1	Acoustical and Insulation Contractor		
C-2	Mechanical Insulation Contractor		
C-3	Asphalt Paving and Surfacing Contractor		
C-3a	Asphalt Concrete Patching, Sealing, and Striping Contractor		
C-3b	Play Court Surfacing Contractor		
C-4	Boiler, Hot-Water Heating and Steam Fitting Contractor		
C-5	Cabinet, Millwork, and Carpentry Remodeling and Repairs Contractor		
C-5a	Garage Door and Window Shutters Contractor		
C-5b	Siding Application Contractor		
C-6	Carpentry Framing Contractor		
C-7	Carpet Laying Contractor		
C-9	Cesspool Contractor		
C-10	Scaffolding Contractor		
C-12	Drywall Contractor		
C-13	Electrical Contractor		
C-14	Sign Contractor		
C-15	Electronic Systems Contractor		
C-15a	Fire and Burglar Alarm Contractor		
C-15b	Telecommunications Contractor		
C-16	Elevator Contractor		
C-16a	Conveyor Systems Contractor		
C-17	Excavating, Grading, and Trenching Contractor		
C-19	Asbestos Contractor		
C-20	Fire Protection Contractor		
C-20a	Fire Repressant Systems Contractor		

	Contractor Classification	Name of Joint Contractor or Subcontractor	License Number
C-21	Flooring Contractor		
C-22	Glazing and Tinting Contractor		
C-22a	Glass Tinting Contractor		
C-23	Gunite Contractor		
C-24	Building Moving and Wrecking Contractor		
C-25	Institutional and Commercial Equipment Contractor		
C-27	Landscaping Contractor		
C-27a	Hydro Mulching Contractor		
C-27b	Tree Trimming and Removal Contractor		
C-31	Masonry Contractor		
C-31a	Cement Concrete Contractor		
C-31b	Stone Masonry Contractor		
C-31c	Refractory Contractor		
C-31d	Tuckpointing and Caulking Contractor		
C-31e	Concrete Cutting, Drilling, Sawing, Coring, and Pressure Grouting Contractor		
C-32	Ornamental, Guardrail, and Fencing Contractor		
C-32a	Wood and Vinyl Fencing Contractor		
C-33	Painting and Decorating Contractor		
C-33a	Wall Coverings Contractor		
C-33b	Taping Contractor		
C-33c	Surface Treatment Contractor		
C-34	Soil Stabilization Contractor		
C-35	Pile Driving, Pile and Caisson Drilling, and Foundation Contractor		
C-36	Plastering Contractor		
C-36a	Lathing Contractor		

	Contractor Classification	Name of Joint Contractor or Subcontractor	License Number
C-37	Plumbing Contractor		
C-37a	Sewer and Drain Line Contractor		
C-37b	Irrigation and Lawn Sprinkler Systems Contractor		
C-37c	Vacuum and Air Systems Contractor		
C-37d	Water Chlorination and Sanitation Contractor		
C-37e	Treatment and Pumping Facilities Contractor		
C-37f	Fuel Dispensing Contractor		
C-38	Post Tensioning Contractor		
C-40	Refrigeration Contractor		
C-40a	Prefabricated Refrigerator Panels Contractor		
C-41	Reinforcing Steel Contractor		
C-42	Roofing Contractor		
C-42a	Aluminum and Other Metal Shingles Contractor		
C-42b	Wood Shingles and Wood Shakes Contractor		
C-42c	Concrete and Clay Tile Contractor		
C-42e	Urethane Foam Contractor		
C-42g	Roof coatings Contractor		
C-43	Sewer, Sewage Disposal, Drain, and Pipe Laying Contractor		
C-43a	Reconditioning and Repairing Pipeline Contractor		
C-44	Sheet Metal Contractor		
C-44a	Gutters Contractor		
C-44b	Awnings and Patio Cover Contractor		
C-48	Structural Steel Contractor		
C-48a	Steel Door Contractor		
C-49b	Hot Tub and Pool Contractor		

	Contractor Classification	Name of Joint Contractor or Subcontractor	License Number
C-51	Tile Contractor		
C-51a	Cultured Marble Contractor		
C-51b	Terrazzo Contractor		
C-52	Ventilating and Air Conditioning Contractor		
C-55	Waterproofing Contractor		
C-56	Welding Contractor		
C-57	Well Contractor		
C-57a	Pumps Installation Contractor		
C-57b	Injection Well Contractor		
C-60	Solar Power Systems Contractor		
C-61	Solar Energy Systems Contractor		
C-61a	Solar Hot Water Systems Contractor		
C-61b	Solar Heating and Cooling Systems Contractor		
C-62	Pole and Line Contractor		
C-62a	Pole Contractor		
C-63	High Voltage Electrical Contractor		
C-68	Classified Specialist		
	Licensed Surveyor		
	Licensed Geotechnical Engineer		
	Licensed Structural Engineer		
	Archaeologist		
	Cultural Monitor		
	Licensed Civil Engineer		
	Supervising Control and Data Acquisition (SCADA) Contractor		
*			
*			
*			
*			

	Contractor Classification	Name of Joint Contractor or Subcontractor	License Number
*			
*			

* Contractor to add licenses as required to complete the scope of work. Attach additional sheet as needed. It is understood and agreed that the Department reserves the right to reject any and/or all offers and waive any defects when, in the Department's opinion, such rejection or waiver shall be for the best interest of the Department.

For purpose of evaluating the criterion described in this solicitation, it is understood and agreed that offers will be compared on the basis of the Total Sum Offer which shall be considered to be the total sum of actual or corrected amounts proposed on each item. The offerors signed Offer shall constitute the Offeror's official offer. The Department reserves the right to designate the contract amount based on selected Offeror's Total Sum Offer depending on the funds available for this Project.

It is also understood and agreed that the work called for under this Project must and shall be completed within **SIX HUNDRED THIRTY (630)** consecutive calendar days after written notice has been given to the successful Offeror to commence work. It is also understood and agreed that the quantities given herewith are approximate only and are subject to increase or decrease and that the undersigned will perform all quantities of work, as either increase or decrease, in accordance with the provisions of the specifications.

It is also understood and agreed that the estimated quantities shown for items for which a UNIT PRICE is listed in the Offer are only for the purpose of comparing on a uniform basis offers offered for the work under this contract, and the undersigned agrees that the undersigned is satisfied with and will not dispute said estimated quantities as a means of comparing the offers. It is understood and agreed that the Offeror will make no claims for anticipated profit or loss of profit because of a difference between quantities of the various classes of work done or the materials and equipment actually installed and the said estimated quantities. On UNIT PRICE offers, payment will be made only for the actual number of units incorporated into the finished project at the contract UNIT PRICE.

It is also understood and agreed that if the product of the UNIT PRICE offer and the number of units does not equal the total amount stated by the Offeror in the offer for any item, it will be assumed that the error was made in computing the total amount. For purpose of evaluating the criterion described in this solicitation, the stated UNIT PRICE alone will be considered as representing the Offeror's intention and the total amount offered on such item shall be considered to be the amount arrived at by multiplying the UNIT PRICE by the number of units.

It is also understood and agreed that the liquidated damages in the amount of **ONE THOUSAND AND 00/100 DOLLARS (\$1,000.00)** for each and every calendar day in excess thereof prior to completion of the contract beyond the specified and approved completion date, shall be withheld from payments due to the Contractor, pursuant to the Damages for Delay provision contained in this solicitation.

It is also understood and agreed that if this offer is accepted, the successful offeror will contract with the Board and said offeror shall furnish the required bonds to the Board within ten (10) days from the date of receiving from the Board the contract prepared and ready for execution.

It is further understood and agreed that the successful offeror will provide all necessary materials, labor, tools, equipment, and other incidental necessary to do all the work and furnish all the materials specified in the contract in the manner and time herein prescribed and according to the requirements of the Department as therein set forth.

The undersigned further understands and agrees that by submitting this Offer, 1) the Offeror is declaring that the Offer is not in violation of Chapter 84, Hawai'i Revised Statutes, and 2) Offeror is certifying that the price(s) submitted was (were) independently arrived at without collusion.

It is also understood and agreed that if this Offer is accepted and the undersigned shall fail to or neglect to contract as aforesaid, the Board may determine that the offeror has abandoned the contract and thereupon forfeiture of the security accompanying the Offer shall operate and the same shall become the property of the Board.

Enclosed herewith is a Bidder's Bond (Bid Security)	()	for the sum
Surety Bond	()	
Legal Tender	()	
Certificate of Deposit	()	
Share Certificate	()	
Cashier's Check	()	
Treasurer's Check	()	
Teller's Check	()	
Certified Check	()	

of _____ DOLLARS
(\$ _____) payable to the Department of Water, being not less than the sum required under Sub-Section 2.9 "Bid Security" of the "General Provisions for Construction Contracts of the Department of Water", dated April 25, 2016.

Evidence of the undersigned Offeror having the authority to submit this Offer and to enter a contract is herewith furnished.

Respectfully submitted,

Name of Offeror

Authorized Signature

Print/Type Name & Title of above

Address, Zip Code

Telephone

Contractor's License No.

State of Hawai'i General Excise Tax License No.

Federal Employer Identification No.

Type of Organization: (Please designate)

- Sole Proprietorship Partnership
- Corporation Joint Venture
- Other (*please specify*) _____

State of Incorporation:

Hawai'i

Other (*please specify*) _____

Name of Performance Bond Surety Co. _____

Address _____

Authorized to do Business in the State of Hawai'i? Yes or No

If corporation, state who will sign contract and signatory's title:

Name

Title

Name	Title

If the Offeror is a CORPORATION, the legal name of the corporation shall be set forth on the Offer, together with the signature(s) of the Officer(s) authorized to sign on behalf of the corporation and the corporate seal affixed thereto. Evidence of the authority of the Officer(s) to sign on behalf of the Corporation SHALL be attached to this page and included in the Offer. Acceptable evidence of authority to sign includes, but is not limited to, a copy of the articles of incorporation, corporate resolution, or corporate by-laws. (See HRS Ch. 415, Hawai'i Business Corporation Act).

If the Offeror is a LIMITED LIABILITY COMPANY, the legal name of the company shall be set forth on the Offer, together with the signature(s) of the member of the limited liability company or manager of the manager-managed limited liability company authorized to sign on behalf of the entity. Evidence of the authority of the Officer(s) authorized to sign on behalf of the company SHALL be attached to this page and included in the Offer.

If the Offeror is a PARTNERSHIP, the legal name of the firm shall be set forth on the Offer, together with the signature(s) of the General Partner(s) authorized to sign on behalf of the partnership. Evidence of the authority of the General Partner(s) authorized to sign on behalf of the partnership SHALL be attached to this page and included with the Offer. Acceptable evidence of authority to sign for the partnership includes, but is not limited to, a copy of the partnership registration statement or authorization signed by all of the partners. (See HRS Ch. 425, Partnerships).

If the Offeror is a SOLE PROPRIETORSHIP, Offeror's signature shall be placed above.

NOTE: PLEASE DO NOT DETACH THIS SAMPLE OFFER FROM THE SPECIFICATIONS. FILL IN ALL BLANK SPACES WITH INFORMATION REQUIRED OR OFFER MAY BE REJECTED.

APPENDIX D: Insurance.

(Bound separately)

APPENDIX E: Wage Certificate for Service Contracts

WAGE CERTIFICATE FOR CONSTRUCTION CONTRACTS

Projects subject to HRS 104

TO: Manager and Chief Engineer

SUBJECT: Solicitation No.: _____

PROJECT: _____

Pursuant to **HRS 103-55.5 Wages and Hours of Employees on Public Works Construction Contracts**, I hereby certify that if awarded the contract in excess of \$2,000, the work to be performed will be performed under the following conditions:

1. Individuals engaged in the performance of the contract on the job site shall be paid:
 - a. Not less than the wages that the director of labor and industrial relations shall have determined to be prevailing for corresponding classes of laborers and mechanics employed on public works projects; and
 - b. Overtime compensation at one and one-half times the basic hourly rate plus fringe benefits for hours worked on Saturday, Sunday, or a legal holiday of the State or in excess of eight hours on any other day; and
2. All applicable laws of the federal and state governments relating to workers' compensation, unemployment compensation, payment of wages, and safety shall be fully complied with.

Offeror: _____

By: _____

Title: _____

Date: _____

APPENDIX F: Certification of Compliance for Final Payment.

CERTIFICATION OF COMPLIANCE FOR FINAL PAYMENT
(Reference §3-122-112, HAR)

Reference: _____
(Contract Number) (IFB/RFP Number)

_____ affirms it is in
(Company Name)
compliance with all laws, as applicable, governing doing business in the State of Hawai'i to include the following:

1. Chapter 383, HRS, Hawai'i Employment Security Law – Unemployment Insurance;
2. Chapter 386, HRS, Worker's Compensation Law;
3. Chapter 392, HRS, Temporary Disability Insurance;
4. Chapter 393, HRS, Prepaid Health Care Act; and

maintains a "Certificate of Good Standing" from the Department of Commerce and Consumer Affairs, Business Registration Division.

Moreover, _____
(Company Name)
acknowledges that making a false statement shall cause its suspension and may cause its debarment from future awards of contracts.

Signature: _____

Print Name: _____

Title: _____

Date: _____

APPENDIX G: Apprenticeship Program.

Bidders seeking preference for this shall:

1. Be a party to an apprenticeship program registered with the State Department of Labor and Industrial Relations (DLIR) at the time of its Offer for each apprenticeable trade the Proposer will employ to construct the public works project for which the Offer is made; and
2. For each apprenticeable trade the proposer will employ for this project, submit with its Offer fully executed and authorized CERTIFICATION OF BIDDER'S PARTICIPATION IN APPROVED APPRENTICESHIP PROGRAM UNDER ACT 17. Schedule F attached to this solicitation verifying participation in apprenticeship program(s) registered with the DLIR.
3. The Contractor shall certify each month that work is being conducted on the project and that it continues to be a participant in the relevant apprenticeship program for each trade it employs. Monthly certification shall be made on MONTHLY REPORT OF CONTRACTOR'S PARTICIPATION IN APPROVED APPRENTICESHIP PROGRAM UNDER ACT 17 (Schedule F-I).

SCHEDULE F - CERTIFICATION OF BIDDER'S PARTICIPATION IN APPROVED APPRENTICESHIP PROGRAM UNDER ACT 17

I. Bidder's Identifying Information			
A. Legal Business Name: _____			
B. Project Bid Title & Reference No.: _____			
C. Contact Person's Name: _____			
1. Phone No.: _____		2. E-Mail: _____	
II. Apprenticeable Trades To Be Employed*	B. Apprenticeship Sponsor* (One Sponsor Per Form)	C. No. Enrolled (# of apprentices currently enrolled as of bidder's request date)	D. No. Completed (# of apprentices who completed the apprenticeship program in the 12 months prior to request date)
A. (List)			
1.			
2.			
3.			
4.			
5.			
6.			
III. Bidder's Certification			
I certify that the above information is accurate to the best of my knowledge. I understand that my willful misstatement of facts may cause forfeiture of the preference under Act 17 and may result in criminal action. I give permission for outside sources to be contacted and for them to disclose any information necessary to verify the bidder's preference.			
_____		_____	
A. Name (Type)		B. Title	
_____		_____	
C. Signature (original signature required)		D. Date	
IV. Apprenticeship Sponsor's Contact Information			
A. Training Coordinator's Name: _____			
B. Address: _____			
C. Phone No.: _____		D. E-Mail: _____	E. Fax No: _____
V. Apprenticeship Program Sponsor's Certification			
I certify that the above information is accurate to the best of my knowledge. I understand that my willful misstatement of facts may cause forfeiture of the bidder's preference and may result in criminal action. I give permission for outside sources to be contacted and for them to disclose any information necessary to verify the bidder's preference under Act 17.			
_____		_____	
A. Name of Authorized Official		B. Title	
_____		_____	
C. Signature (original signature required)		D. Date	

* Name of Apprenticeable Trade and Apprenticeship Sponsor must be the same as recorded in the List of Construction Trades in Registered Apprenticeship Programs that is posted on the State Department of Labor and Industrial Relations website. (Rev. 08/25/2010)

SCHEDULE F-1 - MONTHLY REPORT OF CONTRACTOR'S PARTICIPATION IN APPROVED APPRENTICESHIP PROGRAM UNDER ACT 17

I. Contractor's Identifying Information		II. Reporting Period	
A. Legal Business Name: _____		A. Month: (choose) _____	B. Year: (choose) _____
B. Project Bid Title & Reference No.: _____			
C. Contact Person's Name: _____			
1. Phone No.: _____		2. E-Mail: _____	
III. Apprenticeship Program (Complete a separate form for <i>each</i> apprenticeship program in which workers are employed on the project)			
A. Contractor was a party to an apprenticeship program or programs with the following sponsor: (Give sponsor's name(s).*		B. Was the contractor a party to the program during the <i>entire</i> report month?	
		1. YES <input type="checkbox"/>	
		2. NO <input type="checkbox"/> If NO, state applicable period and why (may be subject to sanctions.)	
III. Contractor's Certification			
I certify that the above information is accurate to the best of my knowledge. I understand that my willful misstatement of facts may cause forfeiture of the preference under Act 17 and may result in criminal action. I give permission for outside sources to be contacted and for them to disclose any information necessary to verify the bidder's preference.			
A. Name (Type) _____		B. Title _____	
C. Signature (original signature required) _____		D. Date _____	
IV. Apprenticeship Sponsor's Contact Information			
A. Training Coordinator's Name: _____			
B. Address: _____			
C. Phone No.: _____		D. E-Mail: _____	
E. Fax No: _____			
V. Apprenticeship Program Sponsor's Certification			
I certify that the above information is accurate to the best of my knowledge. I understand that my willful misstatement of facts may cause forfeiture of the bidder's preference and may result in criminal action. I give permission for outside sources to be contacted and for them to disclose any information necessary to verify the bidder's preference under Act 17.			
A. Name of Authorized Official _____		B. Title _____	
C. Signature (original signature required) _____		D. Date _____	

* Name of Name of Apprenticeship Sponsor must be the same as recorded in the list of Construction Trades in Registered Apprenticeship Programs that is posted on the State Department of Labor and Industrial Relations website. (Rev. 08/25/2010)

APPENDIX H: Notice of Intent to Propose.

NOTICE OF INTENT

DATE

Chief Procurement Officer
Department of Water
County of Kaua'i
4398 Pua Loke Street
Līhu'e, HI 96766

Dear Sir:

In accordance with the Provisions of Section 103D-310, Hawai'i Revised Statutes, you are hereby notified that it is the intent of the undersigned to offer on **JOB NO. 16-04, Water Plan 2020 #WKK-03 MCC, Chlorination Facilities – Kilauea Wells No. 1 and No. 2, KAUA'I, HAWAI'I**, for which Offers will be due on **Friday, June 5, 2020** as required.

I am informed that this Notice of Intent must be received by the CPO no later than 4:30 p.m. Hawai'i Standard Time on **Tuesday, May 26, 2020**.

VERY TRULY YOURS,

SIGNATURE

PRINT OR TYPE NAME & TITLE OF SIGNER

Hawai'i State Specialty License
Type and Classification:

NAME OF FIRM

CONTRACTORS LICENSE NO.

Hawai'i State Business
License No.:

ADDRESS

CITY, STATE & ZIP CODE

TELEPHONE NO.

All prospective offerors must be currently licensed by the Hawai'i Department of Commerce and Consumer Affairs, Division of Professional and Vocational Licensing.

"A" general engineering contractors and "B" general building contractors are reminded that due to the Hawai'i Supreme Court's January 28, 2002 decision in Okada Trucking Co., Ltd. v. Board of Water Supply, et al., 97 Haw. 450(2002), they are prohibited from undertaking any work, solely or as part of a larger project, which would require the general contractor to act as a specialty contractor in any area where the general contractor has no license. Although the "A" and "B" contractor may still submit a Offer on and act as the "prime" contractor on an "A" or "B" project (See, HRS §444-7 for the definitions of an "A" or "B" project.), respectively, and the "A" and "B" contractor obtains "C" specialty contractor's licenses either on its own, or automatically under HAR §16-77-32.). The remaining work must be performed by appropriately licensed entities. It is the sole responsibility of the contractor to review the requirements of this project and determine the appropriate licenses that are required to complete the project.

APPENDIX I: Employment of State Residents on Construction Procurement Contracts.

a. Definitions

“Contract” means contracts for construction under Chapter 103D HRS.

“Contractor” has the same meaning as in section 103D-104, HRS; provided that contractor includes a subcontractor where applicable

“Construction” has the same meaning as in section 103D-104 HRS

“Procurement Officer” has the same meaning as in section 103D-104 HRS

“Resident” means a person who is physically present in the state at the time the person claims to have established the person’s domiciled in the state and shows the person’s intent is to make Hawai‘i the person’s primary residence.

“Shortage trade” means a construction trade in which there is a shortage of Hawai‘i residents qualified to work in the trade.

b. Requirements of Contractor

The contractor awarded this contract shall ensure that Hawai‘i Residents compose not less than eighty percent (80%) of the workforce employed to perform this Contract, calculated as follows:

The eighty percent (80%) requirement shall be determined by dividing the total number of hours worked on a contract by Residents by the total number of hours worked by all employees of the Contractor in the performance of the Contract. Hours worked for any subcontractor of the contractor shall count towards the calculation for purposes of this subsection. The hours worked by employees within shortage trades, as determined by the Department of Labor and Industrial Relations, shall not be included in the calculations for purposes of this subsection.

This requirement shall be applicable during the entire duration of this Contract. A notarized Certification for Employment of State Residents on Construction Procurement Contracts (Schedule I) shall be submitted on a monthly basis with your request for progress payments. If no request for progress payments are made for any month, the Contractor is still responsible to submit the certification on a monthly basis.

c. Penalties

Failure to comply with this requirement shall be subject to any of the following sanctions:

- A. Temporary suspension of work on the project until the Contractor or subcontractor complies with Act 68;
- B. Withholding of payment on the Contract or subcontract as applicable, until the Contractor or subcontractor complies with Act 68;
- C. Permanent disqualification of the Contractor or subcontractor from any further work on the project;

- D. Recovery by the Department of any moneys expended on the Contract or subcontract, as applicable; or
- E. Proceedings for debarment or suspension of the contractor or subcontractor under section 103D-702.

d. Conflict with Federal Law

Act 68 shall not apply if the application of the Act is in conflict with any federal law, or if application of Act 68 will disqualify the Department from receiving federal funds or aid.

CERTIFICATION OF COMPLIANCE
FOR
EMPLOYMENT OF STATE RESIDENTS
ACT 68, SESSION LAWS OF HAWAI'I 2010

Project Title: _____

DOW Project No.: _____

Contract No.: _____

As required by Act 68, Session Laws of Hawai'i 2010 – Employment of State Residents on Construction Procurement Contracts, I hereby certify under oath, that I am an officer of _____ (*Name of Company*) and for the month of _____, 20____, _____ (*Name of Company*) is in compliance with Act 68, SLH 2010, by employing a workforce of whom not less than eighty percent are Hawai'i residents, as calculated according to the formula in the solicitation, to perform this Contract.

- I am an officer of the Contractor for this contract.
- I am an officer of the Subcontractor for this contract.

CORPORATE SEAL

(Name of Company)

(Signature)

(Print Name)

(Print Title)

NOTARY CERTIFICATION

APPENDIX J: Certification of Compliance with HRS 396-18, Safety and Health Programs for Contractor Bidding On Board Construction Jobs

PROJECT NAME: _____

SOLICITATION NO.: _____

This is to certify that the undersigned will comply with the requirements of HRS 396-18, as follows:

(A) Pursuant to HRS 396-18, all bids and proposals in excess of \$100,000 shall include a signed certification from the bidder that a written safety and health plan for the job will be available and implemented by the notice to proceed dates of the project. The written safety and health plan shall include:

- (1) A safety and health policy statement reflecting management commitment;
- (2) A description of the safety and health responsibilities of all levels of management and supervisors on the job, and a statement of accountability appropriate to each;
- (3) The details of:
 - (a) The mechanism for employee involvement in job hazard analysis;
 - (b) Hazard identification, including periodic inspections and hazard correction and control;
 - (c) Accident and "near-miss" investigations; and
 - (d) Evaluations of employee training programs.
- (4) A plan to encourage employees to report hazards to management as soon as possible and to require management to address these hazards promptly; and
- (5) A certification by a senior corporate or company manager that the plan is true and correct.

(B) Failure to submit the required certification may be grounds for disqualification of the bid.

(C) Failure to have available on site or failure to implement the written safety and health plan by the project's Notice to Proceed Dates shall be considered willful noncompliance and be sufficient grounds to disqualify the award and terminate the contract.

Name of Contractor: _____

Signature and Title: _____

Date: _____

APPENDIX K: Special Provisions.

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SPECIAL PROVISIONS

SECTION SP-1 – GENERAL REQUIREMENTS

1.1 GENERAL PROVISIONS, SPECIFICATIONS, AND STANDARD DETAILS: The special provisions, plans, general provisions, Water Standards, DPW Standard Specifications and Details, contract documents and all supplemental documents are essential parts of the contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for the complete work. In case of conflict or discrepancy within any part of the contract, the stricter requirements, including Hawai'i State Statutory requirements, shall govern. Unless it is apparent that a different order of precedence is intended, the special provisions shall govern over plans, general provisions and Water Standards; plans shall govern over general provisions; general provisions shall govern over Water Standards; Water Standards shall govern over DPW Standard Specifications; figured dimensions and drawings take precedence over measurements by scale, and detail drawings; instructions to proposers shall be incorporated and made a part of the special provisions.

1.1.01 GENERAL PROVISIONS FOR CONSTRUCTION CONTRACTS OF THE DEPARTMENT OF WATER, COUNTY OF KAUA'I: The "GENERAL PROVISIONS FOR CONSTRUCTION CONTRACTS OF THE DEPARTMENT OF WATER, COUNTY OF KAUA'I", April 25, 2016 as amended, is by reference incorporated herein and made a part of these specifications.

1.1.02 WATER SYSTEM STANDARDS: The "WATER SYSTEM STANDARDS", 2002, as amended, as adopted by the Department of Water, County of Kaua'i; Board of Water Supply, City and County of Honolulu; Department of Water Supply, County of Maui; Department of Water Supply, County of Hawai'i is by reference incorporated herein and made a part of these specifications. These specifications are not bound in these contract documents, but shall by reference be incorporated herein and made a part of these specifications.

SECTION 302 WATER MAINS AND APPURTENANCES

The following shall supplement the applicable subsections of Division 300 - Construction of the "Water System Standards", 2002.

Make the following amendments to said section:

SECTION 302.02 – TRENCH EXCAVATION.

Add the following paragraph to the "A. General" subsection:

Because construction will occur within residential neighborhoods, the Contractor shall secure all areas under construction with due regard for the safety of all persons and property at all times.

Amend the first paragraph of the "B. Payment" subsection to read:

Payment for trench excavation (without classification), backfill, select borrow, pipe cushion, and cost to safely secure all areas under construction will not be paid for separately but shall be included in the Unit Price for the furnishing and installation of the various items in the Proposal.

SECTION 302.03 – TRENCH BACKFILL.

Add the following paragraph to the “A. General” subsection:

If backfilling ground is continuously wet, pipe cushion and backfill material shall consist of coarse aggregate, ASTM C 33, Size Number 67, and shall be completely encapsulated with non-woven geotextile filter fabric unless approval for other material is granted.

Amend the first paragraph of the “G. Payment” subsection to read:

Payment for aggregate and sand pipe cushion surrounding the pipe, pipe bedding, non-woven geotextile filter fabric pipe cushion encasement, trench backfill, select borrow, warning tape, and backfill at valve boxes, meter boxes, manholes, and handholes will not be paid for separately but shall be included in the Unit Price for the furnishing and installation of the various items in the Proposal.

SECTION 302.04 – SHEATHING.

Add the following paragraph to the “A. General” subsection:

Contractor shall provide and maintain sheathing and bracing as necessary to support excavation and trenching and shall comply with Occupational Safety & Health Administration (OSHA) requirements. The contractor shall deem a competent person for trench excavation and that person shall be on-site during all trench excavation and backfill.

Amend the entire “B. Payment” subsection to read:

Payment for installation and removal of sheathing and bracing, and for additional excavation (without classification), additional aggregate and sand cushion to surround the pipe, additional non-woven geotextile filter fabric to surround the cushion, additional bedding, and additional backfill required because of sheathing or bracing work will not be paid for separately but shall be included in the Unit Price for the furnishing and installation of the various items in the Proposal.

SECTION 302.05 – DEWATERING.

Amend the first paragraph of the “A. General” subsection to read:

In locations where water is present in the trench, the Contractor must dewater by pumping or other means to keep the trench free of water during the installation of pipe cushion, the pipe itself, the testing, connection, relocation, lowering of the water mains, and until backfilling is completed to a point 12 inches above the top of the pipe. The Contractor shall provide proper facilities for delivering all pump water to its intended outfall location and attain all necessary permits required for discharge.

If the Contractor elects to discharge dewatering effluent into State Waters or existing drainage systems, the Contractor shall obtain NPDES General Permit Coverage authorizing discharges associated with construction activity dewatering from the Department of Health, Clean Water Branch (DOW-CWB). The Contractor shall prepare and submit permit application (CWB-NOI Form G) to DOH-CWB and shall not begin dewatering activities until DOH-CWB has issued Notice of General Permit Coverage (NGPC) and shall conduct dewatering operations in accordance with the conditions in NGPC. Contractor shall submit a copy of NPDES dewatering Application and Permit to the Manager.

Amend the entire "B. Payment" subsection to read:

Payment for dewatering activities, including but not limited to the preparation and implementation of NPDES General Permit Coverage authorizing discharges associated with construction activity dewatering, and the installation, maintenance, monitoring, and removal of Best Management Practices (BMPs), will not be paid for separately but shall be included in the Unit Price for the furnishing and installation of the various items in the Proposal.

For all fines received by the Department for non-compliance with the Notice of General Permit Coverage (NGPC), the Contractor shall reimburse the Department within 30 days for the full amount of the outstanding cost the Department has incurred, or the Department will deduct the cost from the Contractor's progress payment.

SECTION 302.06 – "ADOBE" OR CLAY.

Amend the entire "B. Payment" subsection to read:

Exclusive of the payments due for work defined in Section 302.07 – MUD REMOVAL AND CRUSHED ROCK TRENCH STABILIZATION, no separate payment for excavation (without classification) and removal of adobe, clay or other unsuitable material from the pipe trench or for necessary backfill material approved by the Manager to replace those materials will be made; the compensation for such work shall be deemed to be included in the Unit Price for the furnishing and installation of the various items in the Proposal.

SECTION 302.07 – MUD REMOVAL AND CRUSHED ROCK TRENCH STABILIZATION.

Amend the first paragraph of the "B. Payment" subsection to read:

Payment for excavation (without classification) to remove and dispose of mud or undesirable materials from the pipe trench whether native or caused by contractor means and methods will not be paid for separately but shall be included in the Unit Price for the furnishing and installation of the various items in the Proposal.

SECTION 302.08 – BLASTING.

Amend the entire "A. General" and "B. Payment" subsections to read:

No blasting shall be allowed on this project.

SECTION 302.09 – EXCAVATION FOR MANHOLES.

Amend the second paragraph of the “B. Payment” subsection to read:

Payment for excavation (without classification) for manholes will not be paid for separately but shall be deemed to be included in the Unit Price for the furnishing and installation of Manholes.

SECTION 302.10 - EXCAVATION FOR THRUST BLOCKS, BEAMS, AND TEST BLOCKS.

Amend the entire “B. Payment” subsection to read:

Payment for excavation (without classification) and backfill of concrete thrust blocks, thrust beams, reaction blocks, and test blocks will not be paid for separately but shall be included in the Unit Price for installation of Concrete Thrust Blocks, Thrust Beams, Reaction Blocks, and Test Blocks or Waterline installation line items.

SECTION 302.11 – SURPLUS EXCAVATION.

Amend the entire “B. Payment” subsection to read:

Payment for the removal and disposal of surplus excavation material will not be paid for separately but shall be included in the Unit Price for the furnishing and installation of the various items in the Proposal.

SECTION 302.12 - DUCTILE IRON PIPE.

Add the following paragraph to the “A. General” subsection:

Transition couplings shall be Romac Style “501”, Style “RC501”, or approved equal. D.I. to A.C. transition couplings shall be 14" in length.

Add the following paragraphs to the “E. Payment” subsection:

The Unit Price for furnishing and installation of the various sizes of Ductile Iron Pipe shall be inclusive of trench excavation (without classification), trench backfill, pipe cushion, warning tape, sheathing and dewatering of trench, removal and disposal of adobe, clay, mud, and other unsuitable material from the trench, and removal and disposal of surplus excavation material, and all associated cost for licensed Geotechnical Engineer monitoring, analysis, and testing.

Payment for furnishing and installation of transition couplings shall not be made directly, costs for furnishing and installation of transition couplings shall be included in the Lump Sum for the various Connections to Existing Water Mains in the Proposal.

SECTION 302.14 – PLASTIC PIPE.

Add the following paragraphs to the "A. General" subsection:

The contractor shall furnish and install Polyvinyl Chloride (PVC) pipe for this project if required. All types and sizes of PVC pipes shall be AWWA C900, Pressure Class 200, DR14 pipe for pipes larger than 2 ½" or schedule 80 PVC pipe for sizes 2 1/2" and smaller.

Pipe cushion material as called for on the plans shall adhere to the requirements of "Water System Standards" Section 209.02, Pipe Cushion. When ground water is encountered or when required by the Engineer, the pipe cushion shall be wrapped in non-woven geotextile fabric in accordance with the "Water System Standards" Section 212.05, Geotextile Fabrics. The contractor shall retain the services of a licensed Geotechnical Engineer to monitor the quality of pipe cushion material, installation, and compaction of the pipe cushion, geotextile encasement, and trench backfill. The Department of Water will require periodic sieve testing of the pipe cushion material during the course of construction.

If PVC installation will be within State Highways Right-of-Way, installation, work, and materials used for this project shall comply with the requirements in Section 624 – Water System, Section 703.21 – Trench Backfill Material, Section 716 – Geotextiles, and Section 716.03 – Geotextiles for Underdrain Applications of the "Specifications for Road and Bridge Construction", State of Hawai'i, dated 2005, unless otherwise approved by the authoritative agency.

Transition couplings shall be Romac Style "501", Style "RC501", or approved equal. C-900 PVC to A.C. transition couplings shall be 14" in length.

Amend the first paragraph of the "B. Payment" subsection to read:

Payment for furnishing and installation of various sizes of PVC Pipe including all necessary joints accessories and fusion process and accompanying ground restraints, will be made at the respective Unit Price per linear foot based on the actual linear feet of PVC pipe installed (exclusive of valves, fittings, bends, and adapters), cleaned or pigged and successfully hydrotested in the field.

Add the following paragraphs to the "B. Payment" subsection:

The Unit Price for furnishing and installation of the various sizes of PVC Pipe shall be inclusive of trench excavation (without classification), trench backfill, pipe cushion, geotextile filter fabric encasement, conducting cable, warning tape, sheathing, removal and disposal of adobe, clay, mud, and other unsuitable material from the trench, removal and disposal of surplus excavation material, and all associated cost for licensed Geotechnical Engineer monitoring, analysis, and testing.

Payment for furnishing and installation of transition couplings shall not be made directly, costs for furnishing and installation of transition couplings shall be included in the Lump Sum for the various Connections to Existing Water Mains in the Proposal.

SECTION 302.15 – FITTINGS AND SPECIALS (DUCTILE IRON, CONCRETE CYLINDER, PLASTIC PVC PIPE).

Add the following paragraph to the "A. General" subsection:

The contractor shall furnish and install EBAA Iron Series 2000PV MEGALUG Mechanical Joint Restraint for plain end PVC pipe at all mechanical joint fittings and EBAA Iron Series 2100 MEGAFLANGE Restrained Flange Adapter for plain end PVC pipe at all flange joints. Both shall be installed in accordance with the manufacturer's guidelines.

Amend the first paragraph of the "B. Payment" subsection to read:

Payment for furnishing and installing Cast Iron and Ductile Iron Fittings will be made at the Lump Sum Price, complete in place. The Contractor shall be responsible for the actual number of cast iron and ductile iron fittings furnished, installed and tested in the field. If a line item for Cast Iron and Ductile Iron fittings is not specifically provided, the contractor shall include the cost in the furnishing and installation of the waterline unit price.

Amend the fourth paragraph of the "B. Payment" subsection to read:

Payment for furnishing and installation PVC Fittings, including copper toning wire will not be paid for separately but shall be included in the Unit Price for furnishing and installation of the various sized PVC Pipes in the proposal.

Amend the fifth paragraph of the "B. Payment" subsection to read:

Payment for furnishing and installation Flanged by Bell Adapters, Flanged Dismantling Joints, MEGALUG Mechanical Joint Restraint, and MEGAFLANGE Restrained Flange Adapters will not be paid for separately but shall be included in the Lump Sum Price for Cast Iron and Ductile Iron Fittings, in place complete.

SECTION 302.16 – GATE VALVES AND BUTTERFLY VALVES.

Amend the first paragraph of the "A. General" subsection to read:

The contractor shall furnish and install all permanent and temporary gate valves and butterfly valves at locations shown on the plans or as directed by the Engineer. Unless otherwise specified, the installation shall be in accordance with the Standard Details. Specifications for furnishing and installing Temporary Gate Valves will comply with this section of the specification.

Amend the fourth paragraph of the "A. General" subsection to read:

Concrete anchor block with non-corrosive straps will not be required for this project.

Add the following paragraph to the "B. Payment" subsection:

The Unit Price for furnishing and installing Gate Valves and Butterfly Valves and furnishing and installing Temporary Gate Valves shall be inclusive of trench excavation (without classification), cast iron valve box, trench backfill, pipe cushion, warning tape, sheathing and dewatering of trench, removal and disposal of adobe, clay, mud, and other unsuitable material from the trench, and removal and disposal of surplus excavation material.

SECTION 302.17 – AIR RELIEF VALVES.

Add the following paragraph to the “A. General” subsection:

Air relief valves shall be One-Inch Val-Matic Valve & Manufacturing Corp. Combination Air Valve 201C.2 with screened hood, or approved equal.

Amend the second paragraph of the “B. Payment” subsection to read:

The Unit Price for furnishing and installation of Air Relief Valve shall be full compensation for all labor, materials, tools and equipment for excavation (without classification) and backfill, sheathing and dewatering of trench, installation of copper pipes, fittings, various types of valves, ARV, cinder or crush rock cushion, brick saddle, ARV pipe stand, concrete footing, roofing felt, stainless steel straps, screened hood, paint, testing, and all other incidentals to complete this work.

SECTION 302.18 – SERVICE LATERALS, CONNECTIONS AND PIPES.

Add the following paragraphs under “A. General” subsection:

New service laterals shall be terminated with an angle valve in the existing meter boxes to facilitate the reconnection to the water meter.

Where existing meters are located within private properties, the new service lateral will be terminated within the public right-of-way and include a new Type “B” or Type “X” meter box with cast iron cover.

When a new lateral is being installed for an existing Department of Water consumer, the contractor shall furnish and install lateral piping including all fittings and appurtenances between the new meter and the existing consumer piping and perform reconnection work, and include a new meter box and cover.

When an existing lateral is being abandoned, the contractor shall cut and plug the existing lateral at the main. The existing meter box and cover shall be cleaned and transported to the Department’s Baseyard in Līhu‘e or Puhi, unless otherwise directed by the Engineer.

Amend the entire “D. Payment” subsection to read:

Payment covered under service laterals and connections and appurtenances shall be as follows: Payment for furnishing and installing various sizes of new service laterals and service connections, regardless of the lengths of the laterals or connections, will be made at the Unit Price per each unit based on the actual number installed and tested.

The Unit Price for furnishing and installing various sizes of new service laterals, service connections, and appurtenances shall be full compensation for all labor, materials, tools, and equipment for all handling, hauling, unloading, placing, testing, and all other incidental necessary to complete the work.

No separate payment for the furnishing and installation of taps into mains, reconnections to existing consumer piping, temporary connections, cut and plug and removal of existing laterals, transferal of meters, pipes, fittings, ball corps, ball stops, angle valves, globe valves, double hub fittings, tapping tees, service saddles, meter boxes and covers, meter splices, brass pipes, caps, PVC conduits, warning tape, polyethylene wrap, plastic lateral for isolation, nor any other appurtenances will be made. Additionally, no separate payment will be for trench excavation (without classification) and backfill, sheathing and dewatering of trench, pipe cushion, nor transporting existing meter boxes and covers to the Department's Baseyard in Lihu'e or Puhi. The compensation for this work and items shall be deemed to be included in the Unit Price for New Service Laterals.

SECTION 302.19 – METER BOXES.

Amend the entire "B. Payment" subsection to read:

Payment for the furnishing and installation of meter boxes including frames and covers will not be paid for separately but shall be included in the Unit Price for Service Laterals or Air Relief Valve Assemblies.

Payment for the furnishing and installation of Meter Boxes shall be full compensation for all labor, materials, tools and equipment for all handling, hauling, unloading, placing, bricks, concrete, cast iron covers, painting, concrete slabs and all other incidentals necessary to complete the work.

No separate payment for excavation (without classification) and backfill of Meter Boxes will be made; the compensation for such work shall be deemed to be included in the Unit Price for Service Laterals or Air Relief Valve Assemblies.

SECTION 302.20 – FIRE HYDRANTS.

Amend the third paragraph of the "B. Payment" subsection into the following paragraphs:

Payment for excavation (without classification), backfill, sheathing and dewatering of trench, and fire hydrant markers will not be paid for separately but shall be included in the Unit Price for the furnishing and installation of Fire Hydrants.

No separate payment for the furnishing and installation of hydrant elbow, hydrant extension, pipe cushion, flat brick support, and all other appurtenances will be made; the compensation for such work shall be deemed to be included in the Unit Price for Fire Hydrants.

SECTION 302.21 – FIRE HYDRANT MARKERS.

Amend the first paragraph of the "B. Payment" subsection to read:

Payment for hydrant markers will not be paid for separately but shall be included in the Unit Price for the furnishing and installation of Fire Hydrants.

SECTION 302.22 – CONCRETE BLOCKS, JACKETS, BEAMS, CURB GUARDS FOR FIRE HYDRANTS AND METER BOXES, MANHOLE AND VALVE BOX COLLAR.

Amend the entire "B. Payment" subsection to read:

Payment for concrete reaction blocks, thrust beams, thrust blocks and test blocks will be made at the Unit Price per each either by specific proposal line item or as a portion within the furnishing and installation of waterline line item. The Unit Price for concrete reaction blocks, thrust beams, thrust blocks and test blocks shall be full compensation for all labor, materials, tools and equipment for all excavation (without classification), backfill, sheathing, dewatering, concrete, forms, tie wire and chairs, bracings, straps, structural struts, surface finishing, curing, mixing, hauling, furnishing and placing reinforcing steel, and all other incidental materials and work necessary to construct the concrete reaction block, thrust block or thrust beam, in place complete.

Payment for concrete jackets will be made at the Unit Price per linear feet of concrete jacket installed for the various sizes of pipe, regardless of pipe size either by specific proposal line item or as a portion within the furnishing and installation of waterline line item. The Unit Price for concrete jackets shall be full compensation for all labor, materials, tools and equipment for all excavation (without classification), backfill, sheathing, dewatering, concrete, forms, tie wire and chairs, bracings, straps, surface finishing, curing, mixing, hauling, furnishing and placing reinforcing steel, and all other incidental materials and work necessary to construct the concrete jackets in place complete.

Payment for concrete jackets for smaller utility conduits crossing the project's waterlines shall not be made separately. Costs for furnishing and installation of concrete jackets, including miscellaneous items such as warning tapes, shall be deemed to be included in the Unit Price for furnishing and installation of the various sizes and types of pipes in the Proposal.

SECTION 302.24 - VALVE BOXES.

Amend the first paragraph of the "A. General" subsection to read:

Valve boxes for air relief valves, butterfly valves and cleanouts shall be installed in accordance with the Standard Details. Valve boxes for temporary and permanent gate valves shall be furnished and installed in conformance with Standard Detail V11 of the WATER SYSTEM STANDARDS or as defined on the construction drawing for this project. Valve boxes shall be installed 3 feet minimum clear from gutter, curbs, utilities and any structures. For this section, Valve Box specifications for Temporary and Permanent Gate Valves are identical.

Amend the entire "B. Payment" subsection to read:

Payment for the furnishing and installing of valve boxes including cast iron frames and covers and adjusting valve boxes to the required grade will not be paid for separately but shall be included in the Unit Price for Gate Valves or Temporary Gate Valves or Tapping Valves or Cleanout assemblies.

Payment shall be full compensation for all labor, materials, tools and equipment for all excavation (without classification) and backfill, cast iron frames and covers, concrete settlement slab, reinforced concrete collar and leveling slab, standpipe (concrete, cast iron,

ductile iron, or welded steel pipe), brick leveling course, crushed rock fill, pipe cushion, painting, general area clean up, and all other incidentals necessary to complete the work.

No separate payment for backfilling around valve boxes with black sand, sand or coral chips and for temporary backfill and additional excavation (without classification) to expose the risers after chlorination will be made; the compensation for such work shall be deemed to be included in the Unit Price for Gate Valves, Temporary Gate Valves, Tapping Valves, or Cleanout assemblies.

SECTION 302.30 – CONNECTIONS, RELOCATIONS & LOWERING OF WATER MAINS AND LATERALS.

Amend the first paragraph of the “A. General” subsection to read:

Whenever connections to, disconnections from, relocations to, or lowering of existing mains, service laterals, or hydrant laterals are required, the Contractor shall perform all work necessary for the installation of the new or temporary water facility or abandonment of the existing water facility, as shown on the plans, under the coordination of the Manager or his authorized representative.

Add the following paragraph under “A. General” subsection:

The contractor shall utilize temporary waterlines to provide continuous water service and fire protection to existing consumers, as needed.

For this project, Connections to Existing Water Main involve connecting to various types of pipe. The Contractor shall not saw or cut or damage existing asbestos cement pipe. Asbestos cement pipes, fittings, and appurtenances shall be removed at the nearest coupling. The Contractor shall remove and dispose of asbestos cement pipes, fittings, and appurtenances in accordance with Section 302.31.

Amend the entire “B. Payment” subsection to read:

Payment for Connection to Existing Water Main, Connection to Existing Service Lateral, or Connection to Existing Hydrant Lateral which may include the furnishing and installing of pipes, fittings, fire hydrants, gate valves, tapping sleeves and valves, service saddles, hub clamps and other appurtenant materials, will be included in the Lump Sum Price for Connection to Existing Water Main or in the Unit Price for Connection to Existing Service Lateral, Connection to Existing Hydrant Lateral, or temporary bypasses and disconnects.

The Lump Sum Price or Unit Price shall represent full compensation for furnishing all materials, labor, tools, equipment, and incidentals required for excavation (without classification), backfill, sheathing and dewatering of trench, relocating existing gate valves, connections, relocations, disconnections, removal, or lowering of the existing mains as called for on the plans and in accordance with these specifications and inclusive of all incidentals required to complete the work.

No separate payment for cutting, plugging, relocating existing main, lowering of existing mains, providing temporary water service (if necessary), providing temporary fire protection (if necessary), or abandoning of existing mains will be made; the compensation

for such work shall be deemed to be included in the Lump Sum for Connections to Existing Water Main or in the Unit Price for Connection to Existing Service Lateral or Connection to Existing Hydrant Lateral.

No separate payment for installation of bypass lines including cutting, plugging and abandoning existing bypass lines will be made; the compensation for such work shall be deemed to be included in the Lump Sum for Connections to Existing Water Main or in the Unit Price for Service Lateral Connections or Connection to Existing Hydrant Lateral.

SECTION 302.31 – REMOVING OR DEMOLISHING, REINSTALLING OR RETURNING EXISTING PIPES AND APPURTENANCES.

Add the following paragraphs under “A. General” subsection:

The contractor shall be responsible for removal and disposal of existing pipes and appurtenances abandoned within the State and County Right-of-Way. Removal and disposal of pipes shall follow all applicable OSHA, HIOSH, State of Hawai‘i and Federal Regulations. Abatement personnel shall oversee removal and disposal, when required. Unless otherwise directed by the Manager, pipes and appurtenances shall become the property of the Contractor and shall be expeditiously removed from the construction site.

Care shall be exercised when removing and disposing of asbestos cement pipe and appurtenances. If the contractor causes the asbestos cement pipe or appurtenance to become friable, he will not be reimbursed for extra costs incurred to handle, containerize, transport, and dispose of the waste. Disposal of asbestos cement pipe and appurtenances shall be at an approved asbestos disposal site and all disposal related costs shall be borne by the contractor. Disposal of all hazardous materials shall be completed within 24 hours of removal from the water system and shall not be stored within the project site beyond the 24 hour period.

Temporary pipes, fittings, valves, cleanouts, valve boxes with frames and covers, and appurtenances that were installed to provide temporary water service and fire protection shall be salvaged, cleaned, and transported to the Department’s Baseyard in Lihū’e or Puhi.

Amend the first paragraph of the “B. Payment” subsection to read:

Payment for the removal, cleaning, and transporting of existing fire hydrants, standpipes, cleanouts, and air relief valves will be made at the Unit Price per each unit, based on the actual number removed and accepted by the Manager. If a specific proposal line item is not provided, the contractor shall incorporate the costs into the unit price of the furnishing and installation of the applicable waterline. The Unit Price includes full compensation for all labor, materials, tools, and equipment for removing, cleaning, plugging existing water mains, providing temporary water service, restoring disturbed area, and transporting salvaged fire hydrants, standpipes, air relief valves, and appurtenances to the Department’s Baseyard in Lihū’e or Puhi.

Add the following paragraphs to the “B. Payment” subsection:

Payment for removal of existing gate and tapping valves will be made at the Unit Price per each unit, based on the actual number removed and accepted by the Manager. If a specific

proposal line item is not provided, the contractor shall incorporate the costs into the unit price of the furnishing and installation of the applicable waterline. The Unit Price includes full compensation for all labor, materials, tools, and equipment for removing existing valve box components, removing concrete settlement slab, plugging of existing water mains, installing concrete and dirt backfilling, restoration of disturbed area, and cleaning and transporting the salvaged cast iron frames and covers to the Department's Baseyard in Līhu'e or Puhi.

Payment for removal of temporary gate valves and valve box components will be made at the Unit Price per each unit, based on the actual number removed and accepted by the Manager. If a specific proposal line item is not provided, the contractor shall incorporate the costs into the unit price of the furnishing and installation of the applicable waterline. The Unit Price includes full compensation for all labor, materials, tools, and equipment for removing the temporary gate valves and valve box components, removing concrete settlement slab, installing concrete and dirt backfill, restoration of disturbed area, and cleaning and transporting salvaged gate valves and cast iron frames and covers to the Department's Baseyard in Līhu'e or Puhi.

Payment for the removal of temporary pipes and fittings will be made at the Lump Sum or Unit Price for Removal Temporary Water Main. The Lump Sum or Unit Price includes full compensation for all labor, materials, tools, and equipment for excavating (without classification), sheathing, dewatering, disconnecting and removing the temporary pipe and fittings, backfill and restoration of disturbed area, and cleaning and transporting salvaged pipes and fittings to the Department's Baseyard in Līhu'e or Puhi.

Payment for the removal and disposal of existing pipes, fittings, and appurtenances within the State and County Right-of-Way will be made at the Lump Sum or Unit Price for Removal of Water Main. The Lump Sum or Unit Price shall be full compensation for all labor, materials, tools and equipment for excavating (without classification), sheathing, dewatering, disconnecting, removing, processing, storing, hauling, and disposing of abandoned pipes and fittings, backfill and restoration of disturbed area, abatement personnel, disposal and inspection fees, cutting and plugging of existing water mains and laterals, and all other incidental materials and work necessary for the complete removal of abandoned pipes, fittings, and appurtenances.

Payment for the removal and disposal of existing pipes and appurtenances not specified above shall be considered incidental and shall not be paid for separately but shall be included in the Unit Price or Lump Sum for the various items in the proposal. Payment shall be full compensation for all labor, materials, tools and equipment for excavating (without classification), sheathing, dewatering, disconnecting, removing, hauling, storing, and disposing of abandoned pipes and fittings, backfilling and restoring disturbed area, disposal and inspection fees, cutting and plugging of existing water mains and laterals, and all other incidental materials and work necessary for the complete removal of abandoned pipes and appurtenances.

SECTION 302.35 - VALVE MARKERS.

Amend the entire "B. Payment" subsection to read:

Payment for the furnishing and installation of Valve Markers will not be paid for separately, but shall be included in the Unit Price for the installation of various sized of gate or tapping valves. Payment shall be full compensation for all labor, materials, tools and equipment for all excavation (without classification), backfill, concrete, painting, and all other incidental materials and work necessary to complete the work.

SECTION 302.36 – SLOW CURING ASPHALT PAVEMENT (COLD MIX).

Amend “B. Payment”, replace the first paragraph with the following:

Payment for furnishing, placement, maintenance and removal of SLOW CURING ASPHALT (Cold Mix) shall be deemed to be included in the Unit Price for furnishing and installation of the various sizes and types of pipes in the Proposal.

SECTION 302.37 - RESTORING PAVEMENTS, DRIVEWAYS, SIDEWALKS, CURBS, GUTTERS, FENCES, WALLS, AND MISCELLANEOUS.

Add the following paragraphs under “A. General” subsection:

Asphalt concrete (A.C.) pavement resurfacing work shall include cold planing a 2-inch thick layer of existing A.C. pavement and resurfacing with a minimum 2-inch thick layer of new A.C. pavement (State Mix IV or V). Cold planing and resurfacing of A.C. pavement shall be in accordance with the Hawai‘i Standard Specifications for Road and Bridge Construction, 2005. The contractor shall construct the project per the approved construction drawings details and notes and verify potential AC thicknesses that could be encountered prior to submitting a proposal.

Existing pavement striping disturbed by this project shall be restored using thermoplastic extrusion. Painting is not acceptable. Installation of thermoplastic extrusion shall be in accordance with the Hawai‘i Standard Specifications for Road and Bridge Construction, 2005.

Existing reinforced concrete sidewalks, curbs, gutters, ramps, driveways, and swales disturbed by this project shall be restored to State Highways Standards in accordance with the Hawai‘i Standard Specifications for Road and Bridge Construction, 2005 and the Highway’s Division, Design Branch, Standard Plans, 2008.

Amend the entire “C. Payment” subsection to read:

Unless otherwise specified, payment for restoring fences, mail boxes, walls, landscaping, highway signs, highway markers and reflectors, and thermoplastic pavement striping shall not be measured nor paid for directly but shall be considered incidental to the construction work.

Payment for Restoring A.C. Pavement, inclusive of base and subbase courses, will be made at the Unit Price per square yard based on the minimum quantity required to be replaced on the approved plans, measured on the basis of the area of trenches specified for excavation plus an additional of twelve inches on each side of the trench for restoration within the State Right-of-Way or six inches on each side of the trench for restoration within the County Right-of-Way. The Unit Price shall be full compensation for all labor materials,

tools, and equipment, for all handling, removing, placing, maintaining and all other incidental materials and work necessary to complete the Restoring A.C. Pavement work.

Payment for Cold Planing Existing A.C. Pavement and A.C. Pavement Resurfacing will each be made at the Unit Price per square yard based on the minimum quantities required as noted on the approved plans. Each Unit Price shall be full compensation for all labor materials, tools, and equipment, for all handling, removing, placing, maintaining and all other incidental materials and work necessary to complete the Cold Planing of Existing A.C. Pavement and A.C. Pavement Resurfacing work.

Payment for A.C. Pavement resurfacing, will be made at the Unit Price per square yard based on the minimum quantity required to be replaced on the approved plans, measured on the basis of the area of roadway required to be resurfaced within the State Right-of-Way or County Right-of-Way. The Unit Price shall be full compensation for all labor materials, tools, and equipment, for all handling, removing, placing, maintaining and all other incidental materials and work necessary to complete the A.C. Pavement resurfacing work.

Unless otherwise specified, payment for restoration of Reinforced Concrete Sidewalk, Curbs, and Ramps, Reinforced Concrete Driveway, AC Driveways and Reinforced Concrete Swale shall not be measured nor paid for directly but shall be considered incidental to the construction work. If specified as a Unit Price, the Unit Price shall be full compensation for all labor materials, tools, and equipment, for all handling, removing, placing, finishing, maintaining, installation of forms, steel or weld wire fabric reinforcement, base course, and all other incidental materials and work necessary to complete the restoration of Reinforced Concrete Sidewalk, Curbs, and Ramps, Reinforced Concrete Driveway, AC Driveway and Reinforced Concrete Swale work.

Add the Following Section:

SECTION 302.40 – BRACING OF UTILITY POLES.

When excavating close to utility poles, when specified on the plans, or when directed by the Manager, the Contractor shall brace the utility pole if the utility pole is owned by Hawaiian Telcom or pay for bracing if the utility pole is owned by Kaua‘i Island Utility Cooperative (KIUC). In addition to “Bracing of Utility Poles”, the utility agency(s) may require the contractor to stabilize the ground adjacent to the pole(s). “Bracing of Utility Poles” and stabilizing the ground adjacent to the utility pole(s) includes all labor, materials, tools, and equipment necessary to install braces for existing utility poles, stabilize the ground adjacent to the utility poles, and for their removal when bracing and/or stabilizing are no longer necessary. Payment for bracing of utility poles or reimbursement for utility poles braced by KIUC or stabilizing the ground adjacent to the utility poles will not be made directly but shall be included in the Unit Price for the various items in the proposal.

Add the Following Section:

SECTION 302.41 – TRAFFIC CONTROL

Unless provided a specific line item in the proposal, Payment for traffic control work will not be made directly but shall be included in the Unit Price for the various items in the proposal.

SECTION 302.42 - REMOVING AND SALVAGING/DISPOSING OF MATERIALS.

Payment for removal and salvage or disposal of materials (fire hydrants, standpipes, valve boxes, etc.) and for the restoration of the area shall not be made directly; costs for these items of work shall be included in the unit price offer for the various items in the proposal.

Add the Following Section:

SECTION 302.43 – EROSION CONTROL / BMP

Payment for all erosion control / BMP measures shown on the drawings will not be made directly but shall be included in the Unit Price for waterline installation.

1.1.03 DEPARTMENT OF PUBLIC WORKS, COUNTY OF KAUA'I STANDARD SPECIFICATIONS: Whenever reference is made within these Special Provisions or the contract plans to the DPW Standard Specifications, the specifications referred to is the "HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND PUBLIC WORKS CONSTRUCTION" of the State of Hawai'i, 2005, and all subsequent amendments. These specifications are not bound in these contract documents, but shall by reference be incorporated herein and made a part of these specifications.

1.1.04 DEPARTMENT OF PUBLIC WORKS, COUNTY OF KAUA'I, STANDARD DETAILS: Whenever reference is made within these Special Provisions or the contract plans to the DPW Standard Details, the Details referred to is the "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION", September 1984 and all subsequent amendments. The DPW Standard Details are not bound in these contract documents, but shall be incorporated herein and made a part of these specifications by reference.

1.1.05 SPECIAL DEFINITIONS: The following definitions shall apply unless the context indicates otherwise. Wherever the terms "Engineer" or "Owner" are used in any document which forms a part of this contract, they shall mean the Department of Water, County of Kaua'i and its authorized agents.

1.2 PRECONSTRUCTION CONFERENCE: The Contractor shall arrange a preconstruction conference with the Project Manager, along with other affected agencies, firms and individuals within seven (7) days after issuance of "Notice to Proceed".

The Contractor shall submit a construction schedule to the Department of Water at the conference. This construction schedule shall be closely adhered to throughout the period of the contract.

At the preconstruction conference, the Contractor shall submit to the Department, the name of its authorized superintendent of the job.

The Contractor shall notify the Department at least three (3) working days prior to the start of construction.

1.3 CONTRACTOR'S RESPONSES BY HARDCOPY OR FACSIMILE: The Contractor may respond in writing by submitting a hardcopy or by facsimile only to the following Department's requests:

- A. Notice of Intention to Propose.
- B. Request for Clarification.
- C. Pre-Proposal Due Date Modification or Withdrawal of Offers.

The hardcopy or facsimile shall be submitted as specified in the applicable subsection and shall include the following information:

To: Manager & Chief Engineer
 Department of Water, County of Kaua'i

Fax Number: 1-808-245-5813

Attention: Mr. Dustin Moises, P.E.

From:

Date:

Subject: (Subject of Facsimile)

JOB NO. 16-04, WP2020 PROJECT NO. WKK-03, MCC,
 CHLORINATION FACILITIES – KĪLAUEA WELLS NO. 1 AND
 NO. 2, KĪLAUEA, KAUA'I, HAWAII

- 1.4 FAILURE TO COMPLETE ON TIME AND LIQUIDATED DAMAGES: The Contractor shall complete the work within the number of calendar days specified in the contract. The specified number of calendar days shall commence from the date designated in the Notice to Proceed.

Completion of the work within the required time is important since delay in the prosecution of the work will inconvenience the public, obstruct traffic and interfere with business.

If the Contractor fails to complete the work on or before the final completion date specified in the contract, damages will be sustained by the Department of Water, County of Kaua'i. Since the amount of damage, exclusive of the actual cost of engineering, inspection and superintendence, including necessary traveling expenses, is difficult, if not impossible to definitely ascertain and prove, the amount of such damages are fixed in advance at the sum of One Thousand Dollars (\$1,000.00) for each and every calendar day which the Contractor has delayed in the completion of the contract; and the Contractor shall pay that amount as liquidated damages and not by way of penalty, and in case the same are not paid, the Department may deduct the amount thereof from any monies due or that may become due to the Contractor under the contract.

- 1.5 MEASUREMENTS: Figured dimensions and drawings take precedence over measurements by scale. The Contractor must verify all measurements at the site and be responsible for the accuracy of the same.

- 1.6 PROJECT RECORD DOCUMENTS:

1.6.01 SECTION INCLUDES: Overview of maintenance of documents, recording requirements, and submittal of Project Record Documents.

1.6.02 MAINTENANCE OF DOCUMENTS:

A. Maintain a record copy of the following Project Record Documents on-site and record actual revisions to the work:

- (1) Contract Drawings.
- (2) Specifications.
- (3) Amendments.
- (4) Change orders and other modifications to the Contract.
- (5) Reviewed submittals.
- (6) Permits. (Road, Building, Noise, NPDES, etc.)
- (7) Specified installer/tradesman certificates.
- (8) Update Revisions to BMP plans as required by NPDES permit(s).
- (9) Other Project Record Documents as indicated in specific Specification sections.

B. Store Project Record Documents apart from other documents. Provide separate files, racks, and secure storage for Project Record Documents.

C. Record information concurrent with construction progress.

D. Label and file Project Record Documents in accordance with these Specifications. Label each document "PROJECT RECORD" in neat, large, printed letters.

E. Maintain Project Record Documents in a clean, dry and legible condition.

F. Keep Project Record Documents available for inspection.

1.6.03 RECORDING REQUIREMENTS:

A. Use an erasable red pencil (not ink or indelible pencil) to clearly record information or changes on the Drawings by graphic line and note as required. Use an erasable yellow pencil to clearly mark for verification all major components shown as constructed.

B. Use different colors for overlapping changes if required for clarification.

C. Record information concurrently with construction progress. Do not conceal any work until required information is recorded. Date all entries reflecting change.

- D. Legibly mark each item on the Drawings to record actual construction, including:
- (1) Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - (2) Field changes of dimension and detail.
 - (3) Changes made by Contract amendments and modifications.
 - (4) Details not on original Drawings.
 - (5) References to related shop drawings.
- E. Specifications: Legibly mark each item to record actual construction, including the following:
- (1) Manufacturer's name and product model and number.
 - (2) Product substitutions or alternates utilized, as approved by DOW.
 - (3) Changes made by amendment and contract modifications.
- F. As-Built Drawings: The contractor shall provide and keep up-to-date a complete set of as-built prints for this project which shall be corrected regularly, showing every change from the original contract drawing set, including all addenda, change orders, job decisions, etc. The as-built prints shall be used only as a record set and shall be kept on the job site available for the Department's review.

At the time of the final inspection, the contractor shall furnish the Department with one hard copy set of the as built drawings for review. After DOW provides review comments to the contract, the contractor shall provide one hard copy Mylar set with all original signatures and redline changes (**also CADD format and PDF format on CD**) showing all of the changes from the original contract set drawings including addenda, change orders, job decisions, etc. The "As-built Drawings" will be required to include the information stated in the General Provisions and prior to final acceptance as stated in the General Provisions. The "RECORD TRACINGS" block shall be utilized and signature blocks for the contractor, engineer and DOW Manager shall be provided on all sheets.

1.6.04 SUBMITTALS:

- A. At the completion of construction, deliver Project Record Documents.
- B. Transmit the Project Record Documents with a cover letter listing.
- (1) Date.
 - (2) Project title and number.
 - (3) Contractor's name, address, and telephone number.

- (4) Number and title of each Project Record Document.
- (5) Signature of Contractor or authorized representative.

1.7 SUBSTITUTIONS

- A. The materials or products specified herein by trade name shall be provided as specified. Notwithstanding any reference in the specifications to any article, device, product, material, fixture, form or type of construction by name, make or catalog number, such references shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition. Brand names where used on the plans or in the specifications shall be presumed to be followed by the words “or approved equal.” Such approval will be granted only under the following conditions: Substitution of a brand other than specifically name in the contract documents will be approved by the Department of Water if it meets the following conditions:

That it is equal or superior to the brand name in the specifications in construction, efficiency and utility.

That it is equal or less in cost to the Owner.

That during the construction period, the material or product specified cannot be delivered to the job in time to complete the work in proper sequence due to conditions beyond the control of the Contractor.

- B. To receive consideration, request for substitutions must be accompanied by documentary proof of the quality, difference in price and delivery, if any, in the form of certified quotations from suppliers of both specified and proposed materials or products. In case of a difference in price, the County shall receive all-benefit of the difference in cost involved by change order or credit the County with any savings so obtained.
- C. If substitution of any brand other than the one specifically named requires changes to work detailed or specified under other headings, then the Contractor assumes all responsibility for this work.
- D. Substitution request must be received by said date in Section 1.9 “Substitute Materials” (Section 1-Administration, Page 20).

1.8 STORAGE, WORK ZONE, CONSTRUCTION ACCESS: Department of Water shall not assume the responsibility to approve proposed storage areas, work zones, construction traffic pattern in and out of the project site. The Contractor shall be responsible for all additional NPDES permits, as well as, all updates to approved BMPs per NPDES permit approval requirements.

1.9 PRESERVATION OF PROPERTY: Due care shall be exercised to avoid injury to existing roadway improvements or facilities, utility facilities, adjacent property and roadside trees, shrubs and other plants that are not to be removed.

Roadside trees, shrubs and other plants that are not to be removed, and pole lines, fences, walls, signs, markers and monuments, buildings and structures, manholes and handholes, conduits, pipelines under or above ground, drain and sewer and water lines, all roadway facilities and any other improvements or facilities within or adjacent to the project shall be protected from injury or damage and if ordered by the Department of Water, the Contractor shall provide and install suitable safeguards, approved by the Department of Water, to protect such objects from injury or damage. If such objects are injured or damaged by reason of the Contractor's operations, they shall be replaced or restored at the Contractor's expense. The facilities shall be replaced or restored to a condition as good as when the Contractor entered upon the work, or as good as required by specifications accompanying the contract. The Department of Water may require the Contractor to make or cause to be made such temporary repairs borne by the Contractor and may be deducted from any moneys due or to become due to the Contractor under this contract. The fact that any underground facility is not shown upon the plans shall not relieve the Contractor of his or her responsibility. It shall be the Contractor's responsibility to ascertain the existence of any underground improvements or facilities which may be subject to damage by reason of this operation.

Full compensation for furnishing all labor, materials, tools, equipment and incidentals, and for doing all the work involved in protecting or repairing property shall be considered as included in the prices paid for the various contract items of work and no additional compensation will be allowed.

- 1.10 EXTRA WORK: No work of any kind in connection with the work covered by these specifications and plans shall be considered as extra work, or entitles the Contractor to extra compensation, except when the work has been ordered in writing by the Department of Water, and specifically referred to as EXTRA WORK and the amount of compensation stated in the change order.
- 1.11 BUILDING LAWS: The Contractor shall comply with the local laws, ordinances, rules and regulations bearing on the work and he must obtain and pay for all permits, licenses, certificates and give all notices required thereby.
- 1.12 DELIVERY OF MATERIALS AT SITE: Have all materials delivered at the site in such quantities as will ensure the uninterrupted progress of the work and the least obstruction of the premises and the adjoining property.
- 1.13 DEFECTIVE MATERIALS: When requested, furnish, without charge, samples of all materials entering into the work. All materials not conforming to the requirements of these specifications shall be considered as defective and all such materials, whether in place or not, shall be rejected.
- 1.14 CLEAN UP: On the completion of each day's work during this construction project, the Contractor shall remove from the site all debris, tools and excess material resulting from his or his subcontractor's the work and leave the work and any affected surroundings area broom clean.
- 1.15 ENVIRONMENTAL PROTECTION: The Contractor shall comply with the requirements for pollution control in performing all construction activities as set forth in the General Provisions.

1.16 PROJECT SIGN: The Contractor shall furnish, erect, maintain and remove one (1) project sign. The project signboard shall be 3/4 inch thick "AC" exterior grade fir plywood, 4 feet in height and 8 feet long. Sign shall be painted with one prime coat and two finish coats. The sign layout detail and sign and post details shall be submitted to the Department for approval. The project sign shall be erected at the site designated by the Department of Water within seven (7) calendar days after approval of the sign layout. The Contractor shall apply and pay for all permits and fees required for the placement of the sign. The sign layout shall include the Department of Water's logo (graphic to be provided by the Department of Water) and the following information:

MCC, CHLORINATION FACILITIES – KĪLAUEA WELLS NO. 1 & NO. 2
JOB NO. 16-04
WP2020 PROJECT NO. WKK-03
DEPARTMENT OF WATER

1.17 SUBMITTALS:

1.17.01 SECTION INCLUDES: Overview of transmittal of submittals, submittals requirements, definition of submittal for review and definition of submittal for closeout.

1.17.02 RELATED SECTIONS: Section 1.6 Project Record Documents.

1.17.03 TRANSMITTAL OF SUBMITTALS:

A. General: Transmit submittals, number of copies as indicated in subsequent articles, to the following address:

Kaua'i Department of Water
Attn: Dustin Moises, P.E.
4398 Pua Loke Street
Lihu'e, Kaua'i, Hawai'i 96766

B. Submittals for Review: Transmit one (1) copy to the Department of Water for review. The Department will retain electronic set and return one (1) reviewed set. Should the contractor require more returned, he shall provide the additional sets at his or her cost. Where more copies are called for in any section of these Special Provisions, the Contractor shall be required to submit said number of prints for approval.

Whenever possible, submittals/transmittals shall also be submitted electronically.

C. Submittals for Closeout:

(1) Operations and Maintenance Manuals:

a. Preliminary Submittal: Transmit one (1) copy of manual to the Department of Water two (2) weeks prior to final inspection. These copies will be returned after final inspection, with comments.

b. Final Submittal: Revise manuals and submit two (2) copies to the Department of Water two (2) weeks after receipt of comments to Preliminary Submittal.

- (2) Project Record Documents: Submit Project Record Documents at the time of final inspection.

1.17.04 SUBMITTAL REQUIREMENTS:

- A. Required submittals shall include:
 - (1) Shop drawings.
 - (2) Piping layout.
 - (3) Manufacturer's Data.
 - (4) Certificates of Warranty.
 - (5) Any others as called for in the plans, specifications, or by the Engineer.
- B. The Contractor's stamp and verification of drawings shall consist of the following information:

CONTRACTOR NAME

PROJECT: _____

JOB NO.: _____

THIS SUBMITTAL HAS BEEN CHECKED BY THIS GENERAL CONTRACTOR. IT IS CERTIFIED CORRECT, AND IN COMPLIANCE WITH CONTRACT DRAWINGS AND SPECIFICATIONS. ALL AFFECTED CONTRACTORS AND SUPPLIERS ARE AWARE OF, AND WILL INTEGRATE THIS SUBMITTAL INTO THEIR OWN WORK.

DATE RECEIVED: _____

SUBMITTAL NUMBER: _____

SPECIFICATION SECTION: _____

SPECIFICATION PARAGRAPH: _____

DRAWING NUMBER: _____

SUBCONTRACTOR NAME: _____

SUPPLIER NAME: _____

MANUFACTURER NAME: _____

CERTIFIED BY: _____

- C. This stamp, "filled in", should appear on the title sheet of each shop drawing, on a cover sheet of submittals in an 8½"x11" format, or on a one face of a cardstock tag (min. 3"x6") tied to each sample. The tag on samples should state what the sample is, so that, if the tag is accidentally separated from the sample, it can be matched up again.
- D. The person signing the Contractor's submittal stamp shall be the person with authority to act for the Contractor in connection with the contract during the performance of the contract. The signature shall be in original ink. Stamped signature will not be acceptable.

- E. Prepare submittals to show that the material, equipment, or work shown is in accordance with contract requirements and has been checked for dimensions and relationship with work of all other trades involved. All deviations from the plans and specifications shall be noted.
- F. Approval shall extend only to general conformance and shall not relieve the Contractor from his or her responsibility for coordinating his or her work with other trades and complying with the provisions of the contract documents for lengths, fits, quality of materials, quantities, applicable code requirements and other details. Approval does not authorize changes from the contract requirements unless stated in a separate letter or change order.
- G. Submittals shall be made in sufficient time to allow the Engineer not less than twenty regular working days for examining the drawings. The Contractor shall make submittals at the earliest possible date after the Notice to Proceed date to meet the construction schedule. The Engineer will not consider delays caused by the Contractor's failure to make submittals on time as justifiable reasons for contract time extensions.
- H. When the submittals have been reviewed by the Engineer, two sets of submittals will be returned to the Contractor appropriately stamped. If major changes or corrections are necessary, the submittal may be rejected and one set will be returned to the Contractor with such changes or corrections indicated, and the Contractor shall correct and resubmit six copies of the drawings, unless otherwise directed by the Engineer. No changes shall be made by the Contractor to the resubmitted shop drawings other than those changes indicated by the Engineer. The resubmittal shall be so indicated on the shop drawing.
- I. Prior to approval of such drawings, any work which the Contractor may do on fabrications covered by the same is at his or her own risk, as the County will not be responsible for any expense incurred by the Contractor for changes to make the same conform to the drawings as finally approved.
- J. Upon approval of the above drawings, lists, prints and other data, a copy of the same shall be kept with the job site plans, and the fabrications furnished shall be in conformance with the same. However, approval of above drawings, lists, prints, specifications and other data shall in no way release the Contractor from his or her responsibility for the proper fulfillment of the requirements of this contract nor for fulfilling the purpose of the installation nor from his or her liability to replace the same should it prove defective or fail to meet the specified requirements.
- K. Submittal Clarity:
 - (1) Drawings:
 - a. Prepare finished drawings so that prints, reproducibles, and reductions to half size will be clear and legible.
 - b. Make free-hand lettering no less than 5/32 inch high and typewritten notes no less than 1/8 inch high to allow for reduction. Do not crowd lettering.

(2) Manufacturer's Literature:

- a. Submit a minimum of one original of manufacturer's printed material. Remaining number of submittals may be reproductions. Ensure reproductions of original materials are clear and legible.
- b. Clearly mark the item(s) and/or information applicable to this project with arrows, bubbles, etc. Do not use high-lighted markings.
- c. Provide the name and phone number of manufacturer's sales and service representative for each device submitted.

1.17.05 DEFINITION OF "SUBMITTALS FOR REVIEW":

- A. Catalog Data: Manufacturer's standard printed information on materials, products and systems, which shows performance characteristics, dimensions, material of fabrication, and other characteristics necessary to assure conformity with the design requirements. Where other items or information not related to the work of this project are included in the literature submitted, the item(s) and/or information applicable to this project shall be clearly marked.
- B. Shop Drawings: Drawings necessary to show fabrication details to ensure compliance with contract documents.
- C. Block Diagrams: Block Diagrams necessary to show system connections and details to ensure compliance with contract documents.
- D. Wiring Diagrams: Drawings showing the point-to-point or schematic wiring of a piece of equipment or between pieces of equipment in a system.
- E. Calculations: The methods and results of calculations in documented form where specified.
- F. Material / Parts List: A list of system components or material components.
- G. Samples / Colors: Samples, including colors, of proposed materials.
- H. Certifications: A written statement, signed by a qualified party, attesting that items or services are in accordance with specified requirements. Typically, this written statement is accompanied by additional information to substantiate the statement.
- I. Installation Instructions / Test Procedures: Manufacturer's instructions, step-by-step if necessary, showing the field installation and testing of parts, components, equipment, and other similar items.
- J. Test Reports: Results of specified test requirements.
- K. Meetings: Schedule, agenda, attendees, and location for required meetings and meeting notes.

L. Other: Other submittal information as described in individual specification sections.

1.17.06 DEFINITION OF "SUBMITTALS FOR CLOSEOUT":

A. Operations and Maintenance (O&M) Manuals:

(1) Format:

a. Hardcopy: Three (3) full sets

- 1) Size: 8½"x11". Fold 11"x17" drawings to 8½"x11" size. Reduce drawings larger than 11"x17" format to 11"x17" format.
- 2) Binders: Use commercial quality expandable post binders meeting the following requirements:
 - (a) Binder Covers: 1/8" thick construction (minimum).
 - (b) Hinges: Continuous, metal piano hinge.
 - (c) Binder Expandability: 3½" – 5½".
 - (d) Sheet Size: 8½"x11".
 - (e) Binder Cover Material: Heavy vinyl.
 - (f) Binder Printing: Provide custom printed spine and front imprinted with the following information:

County of Kaua'i
Department of Water
(Print O&M manual titles and project title)

- (g) Manufacturer's Reference: Specialty Loose Leaf, Inc.
 - 3) Fill: Do not fill binders more than 75% full.
 - 4) Indexed Tabs: Internally subdivide the binder contents with permanent page dividers, logically organized, with tab titling clearly printed under reinforced laminated plastic tabs.
- b. Adobe PDF Electronic Copy: Provide a facsimile of the hardcopy O&M Manual in Adobe PDF Electronic Format on compact disk(s).
- c. Electronic Data: Provide electronic files on compact disk(s) of any material created electronically by Integrator, in file format in which document was created, that is, Microsoft Word, AutoCAD, etc., including but not limited to:
- 1) Drawing Files.
 - 2) Installation Instructions.
 - 3) Software Documentation.

- 4) Operating and Maintenance Instructions.
- d. Odd Sized Material: Where O&M information does not lend itself to incorporation into 8½"x11" format, such as the material listed, below, provide it separate from the O&M Manuals. However, clearly label each item, and provide reference in the O&M Manual to the material that is provided separate from the O&M Manuals.
 - 1) Edge-glued books or manuals without 3-hole punched binding.
 - 2) Material of a size other than 8½"x11".
 - 3) Compact disks in jewel cases.

(2) Contents:

- a. Table of Contents: Prepare a Table of Contents, for each volume, with each product or system description identified, and include with each volume of manual. Type on 24-pound white paper.
- b. Directory: Provide names, addresses, and telephone number of Prime Contractor, Integrator, Installation Contractor, other subcontractors, and major equipment suppliers. Clearly identify contact for warranty support.
- c. General: Provide operations and maintenance data for equipment described in the individual sections of the Specification. Prepare and include additional data when the need for such data becomes apparent during training.
- d. Description of System and Component Parts:
 - 1) System block and interconnection diagrams.
 - 2) Control diagrams by controls vendor and as-installed control drawing by Contractor.
 - 3) As-installed wiring diagrams, that is, ladder diagrams, point to point diagrams, loop diagrams, circuit directories of panel boards, and similar items.
 - 4) Manufacturer's printed installation, operating, and maintenance instructions for the exact item of equipment supplied.
 - 5) Catalog data containing information required for service, future additions or substitutions.
 - 6) Function, normal operating characteristics, and limiting conditions.
 - 7) Performance curves, engineering data and tests.
 - 8) Complete nomenclature and commercial number of replaceable parts.
- e. System Operating Procedures:
 - 1) Description of sequence of operation by control manufacturer.

- 2) Routine and normal operating instructions.
 - 3) Sequences required.
 - 4) Special operating instructions.
- f. System and Equipment Maintenance Procedures:
- 1) Routine operations.
 - 2) Guide to “trouble-shooting”
 - 3) Disassembly, repair and reassembly.
 - 4) Alignment, adjusting and checking.
- g. Maintenance instructions for special finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.
- h. Spare Parts List: List of manufacturer’s spare parts provided with the job, manufacturer’s current prices for spare parts, and recommended quantities to be maintained in storage.
- B. Project Record Documents: Provide Project Record Documents as required.
- C. Spare Parts / Maintenance Materials:
- (1) Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification sections prior to Final Acceptance.
 - (2) Deliver to Project site and place in location as directed by the Department of Water. Contractor shall obtain receipt.
- D. Test Reports: Results of specified test requirements. Provide Table of Contents of test results and incorporate into Operation and Maintenance Manuals described above.
- E. Warranty Certificates:
- (1) For each item required by specific sections of this specification, provide a notarized warranty certificate.
 - (2) Execute and assemble documents from subcontractors, suppliers, and manufacturer.
 - (3) For each item of copyrighted software provide under this contract, provide a software license certificate naming the Department of Water as the licensee and stating the number of licenses provided.
 - (4) Provide Table of Contents of software licenses and incorporate into Operation and Maintenance Manuals described above.

- 1.18 CONTRACTOR'S OPERATIONS: The Contractor must employ, insofar as possible, such methods and means of carrying out his work so as not to cause any interruption or interference to the Department of Water's or the landowner's operations. Where the Contractor's operations would result in interruptions which would hamper the operations, the Contractor shall coordinate his schedule of work with the Department of Water or the landowner, accordingly.

In the event that the Contractor obtains permission from the landowner for use of any area or resources outside of the designated lot(s), County Right-of-Way, State Highway's Right-of-Way, and/or designated easement(s), the Contractor shall meet the requirements of Division 300, Section 301.15 – USE AND/OR DAMAGE TO PRIVATE PROPERTY (PROPERTY OWNED OTHER THAN BY THE CONTRACTOR) of the Water System Standards, 2002.

END OF SECTION

SECTION SP-2 ENVIRONMENTAL POLLUTION CONTROL

TABLE OF CONTENTS FOR SECTION SP-2

<u>SECTION</u>	<u>DESCRIPTION</u>
2.0	ENVIRONMENTAL POLLUTION CONTROL

SECTION SP-2 – ENVIRONMENTAL POLLUTION CONTROL

2.1 GENERAL: This section covers the requirements of environmental pollution control during construction activities. The Contractor shall be responsible for conformance to Title 11, Chapter 60 of the Public Health Regulations, Department of Health, State of Hawai'i.

2.2 GUIDELINES AND CRITERIA:

A. EROSION AND SEDIMENT CONTROL:

- (1) Soil Protection and drainage facilities shall be completed as early as practicable. Sections of bare earth and the length of their exposure to erosion shall be minimized by proper scheduling and limiting the work areas.
- (2) Surface drainage from cuts and fills within the construction limits and from borrow and waste disposal areas shall, if turbidity producing materials are present, be held in suitable sedimentation ponds or shall be graded to control erosion within acceptable limits.

B. LANDSCAPE PRESERVATION AND PROTECTION:

- (1) Construction activities shall be confined to the work areas defined by the plans and specifications. Care shall be exercised to preserve the natural landscape.
- (2) All scars made on trees by equipment, construction operations, or by removal of limbs larger than one inch in diameter shall be coated as soon as possible with an approved tree wound dressing.
- (3) All items having any apparent historical or archaeological interest which are discovered in the course of any construction activities shall be carefully preserved.

C. DUST CONTROL: Dust which could damage crops or dwellings or cause nuisance to persons shall be abated and control measures shall be performed. The Contractor shall be held liable for any damage resulting from dust originating from his operations.

D. WASTE DISPOSAL:

- (1) Care shall be exercised to ensure that disposal of wastes from construction operations do not create pollution problems.
- (2) Disposal of any materials, wastes, effluent, trash, garbage, oil, grease, chemicals, etc., shall meet all regulatory requirements and be subject to the approval of the Manager.
- (3) Waste Waters: Construction operations shall be conducted so as to prevent discharge or accidental spillage of pollutants, solid waste, debris, and other objectionable wastes in surface waters and underground water sources.
- (4) Disposal of waste materials including drill cuttings, well cleaning, development and pump testing waste waters, etc. shall meet all regulatory requirements and be subject to the approval of the Manager.

E. NOISE CONTROL: The operating schedule of large horsepower heavy equipment shall be planned to have the least impact upon nearby residents. Night operations shall only be conducted with the prior approval of the Manager and shall be curtailed or stopped when a disturbance is created.

2.3 MEASUREMENT AND PAYMENT: The cost for any pollution control activity specified above or deemed necessary by the Manager will not be measured nor paid for directly but will be considered as incidental to and included in the total sum Offer.

END OF SECTION

SECTION SP-3 PIPING

TABLE OF CONTENTS FOR SECTION SP-3

<u>SECTION</u>	<u>DESCRIPTION</u>
3.0	DUCTILE IRON PIPE AND PVC (C-900) PIPE

SECTION SP-3 – DUCTILE IRON PIPE AND PVC (C-900) PIPE

DUCTILE IRON:

3.01 GENERAL: The Contractor shall furnish and install Ductile Iron (DI) pipe in accordance with “Water System Standards, State of Hawai‘i, dated 2002”. DI pipe shall meet the requirements of Section 202.01. Fittings for DI pipe shall be ductile iron mechanical joint fittings meeting the requirements of Section 202.01.A – Fittings, unless specifically stated otherwise in the plans. Installation shall be in accordance with the Water System Standards.

3.02 SUBMITTALS: The Contractor shall submit manufacturer’s data on DI pipe, joints, fittings and geotextile fabric certifying that the product provided meets the specified item.

Prior to excavation the Contractor shall provide submittal that certifies that the pipe cushion material meets requirements below. Onsite sand must be tested by a licensed geotechnical engineer and test results submitted to the Department of Water Engineer for approval.

3.03 TRENCH EXCAVATION AND BACKFILL: Trench excavation and backfill shall meet the requirements of “Water System Standards” Sections 302 Water Mains and Appurtenances; Section 302.02 – Trench Excavation; Section 302.03 Trench Backfill; Section 302.04 Sheathing; Section 302.05 Dewatering; Section 302.06 Adobe or Clay; Section 302.07 Mud Removal and Crushed Rock Stabilization; Section 302.09 Excavation for Manholes; Section 302.10 Excavation for Thrust Blocks, Beams and Test Blocks; Section 302.11 Surplus Excavation; and Section 302.14 Plastic Pipe.

Pipe Cushion Material shall meet the requirements of “Water System Standards” Section 209.02 Pipe Cushion. Pipe cushion material shall be free from hard lumps, debris, salt, hazardous substances above its corresponding regulatory action level, and other deleterious substances.

When groundwater is encountered, pipe cushion material shall be wrapped in a non-woven geotextile fabric as specified in Section 212.05 – Geotextile Fabrics. However if groundwater is encountered within the State Highway’s Right-of-Way, pipe cushion material shall conform to ASTM C 33, size number 67, and shall be completely encapsulated with geotextile conforming to Subsection 716.03 – Geotextiles for Underdrain Applications as stated in the “Standard Specifications for Road and Bridge Construction, State of Hawai‘i, dated 2005”.

3.04 INSTALLATION: Ductile iron pipe installation shall meet the requirements of Water System Standards Section 302 – Water Mains and Appurtenances, additionally for pipe installation within the State Highway’s Right-of-Way, pipe installation shall also adhere to the requirements of “Standard Specifications for Road and Bridge Construction, State of Hawai‘i, dated 2005”, Section 624 – Water System and Section 703.21 – Trench Backfill Material.

Contractor shall retain the services of a licensed Geotechnical engineer to monitor the quality of pipe cushion material, installation and compaction of the pipe cushion and trench backfill. Department of Water will require periodic sieve testing of the pipe cushion material during the course of construction. Results of the Geotechnical engineer’s tests shall be provided to the Department of Water within seven (7) calendar days of sampling. Contractor shall be responsible for all associated costs for the licensed Geotechnical engineer, sieve analysis and testing.

PVC (C-900) PIPE:

3.05 GENERAL: The Contractor shall furnish and install Plastic pipe in accordance with “Water System Standards, State of Hawai‘i, dated 2002”. PVC pipe shall meet the requirements of Section 204.01. Fittings for PVC pipe shall be mechanical joint fittings meeting the requirements of Section 204.01.D – Fittings, unless specifically stated otherwise in the plans. Installation shall be in accordance with the Water System Standards.

3.06 SUBMITTALS: The Contractor shall submit manufacturer’s data on PVC pipe, joints, fittings and geotextile fabric certifying that the product provided meets the specified item.

Prior to excavation the Contractor shall provide submittal that certifies that the pipe cushion material meets requirements below. Onsite sand must be tested by a licensed geotechnical engineer and test results submitted to the Department of Water Engineer for approval.

3.07 TRENCH EXCAVATION AND BACKFILL: Trench excavation and backfill shall meet the requirements of “Water System Standards” Sections 302 Water Mains and Appurtenances; Section 302.02 – Trench Excavation; Section 302.03 Trench Backfill; Section 302.04 Sheathing; Section 302.05 Dewatering; Section 302.06 Adobe or Clay; Section 302.07 Mud Removal and Crushed Rock Stabilization; Section 302.09 Excavation for Manholes; Section 302.10 Excavation for Thrust Blocks, Beams and Test Blocks; Section 302.11 Surplus Excavation; and Section 302.14 Plastic Pipe.

Pipe Cushion Material shall meet the requirements of “Water System Standards” Section 209.02 Pipe Cushion. Pipe cushion material shall be free from hard lumps, debris, salt, hazardous substances above its corresponding regulatory action level, and other deleterious substances.

When groundwater is encountered, pipe cushion material shall be wrapped in a non-woven geotextile fabric as specified in Section 212.05 – Geotextile Fabrics. However if groundwater is encountered within the State Highway’s Right-of-Way, pipe cushion material shall conform to ASTM C 33, size number 67, and shall be completely encapsulated with geotextile conforming to Subsection 716.03 – Geotextiles for Underdrain Applications as stated in the “Standard Specifications for Road and Bridge Construction, State of Hawai‘i, dated 2005”.

3.08 INSTALLATION: Plastic pipe installation shall meet the requirements of Water System Standards Section 302 – Water Mains and Appurtenances, additionally for pipe installation within the State Highway’s Right-of-Way, pipe installation shall also adhere to the requirements of “Standard Specifications for Road and Bridge Construction, State of Hawai‘i, dated 2005”, Section 624 – Water System and Section 703.21 – Trench Backfill Material.

Contractor shall retain the services of a licensed Geotechnical engineer to monitor the quality of pipe cushion material, installation and compaction of the pipe cushion and trench backfill. Department of Water will require periodic sieve testing of the pipe cushion material during the course of construction. Results of the Geotechnical engineer’s tests shall be provided to the Department of Water within seven (7) calendar days of sampling. Contractor shall be responsible for all associated costs for the licensed Geotechnical engineer, sieve analysis and testing.

END OF SECTION

SECTION SP-4 NATIONAL POLLUTION ELIMINATION DISCHARGE SYSTEM

TABLE OF CONTENTS FOR SECTION SP-4

<u>SECTION</u>	<u>DESCRIPTION</u>
4.0	NPDES REQUIREMENTS

SECTION SP-4 – NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

4.01 HYDROTESTING EFFLUENT DISCHARGE:

- A. GENERAL PROVISIONS: This item of work shall include the furnishing of all labor, materials, tools, and equipment necessary for construction water disposal.
- B. REGULATIONS:
- (1) The Contractor shall be familiar with and meet the latest requirements of all applicable National Pollutant Discharge Elimination System (NPDES), State Department of Health (DOH), and State Department of Transportation (DOT) ordinances, rules, regulations and permits. Effluent discharge into State receiving waters shall not be made without approved permits. Discharge activities shall include, but shall not be limited to, effluent associated with pipeline hydrotesting/chlorination operations.
 - (2) The Contractor shall obtain all permits and licenses, pay all charges, fees, and taxes, give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified in the contract documents.
- C. PROCEDURES:
- (1) The DOW has not applied for and was granted a Notice of General Permit Coverage (NGPC) to discharge hydrotesting effluent associated with the construction activities from the project. The Contractor shall review the project and compile all documents required to complete the Notice of Intent (NOI), Form F (NOI-F), if contractor deems necessary. The necessary information to complete the NOI-F must be filed at least 30 days prior to the start of any construction activities.
 - (2) The Contractor is expected to comply with the conditions set forth in the permit. Any modifications or amendments to the permit by the Contractor shall be done at the Contractor's expense and no time extension will be granted. The DOW shall approve all modifications or amendments.
 - (3) The Contractor shall make no claims for compensation due to delays or requirements imposed in obtaining an approved NPDES permit. Notice to Proceed will not be delayed due to Contractor's inability to attain an approved NPDES permit.
 - (4) As required for the discharge of effluent, the Contractor shall also secure all other applicable State and County discharge and connection permits and pay all applicable fees. The Contractor shall fulfill all conditions of the NPDES Permit and all other permits when issued. A copy of all approved permits, when issued, shall be provided to the DOW for information only.
 - (5) The Contractor shall be responsible for monitoring, collecting samples, and having samples analyzed by a qualified laboratory and submit the analysis report to DOH. All costs shall be borne by the Contractor.
 - (6) If the DOH is not completely satisfied with the Contractor's BMP Plan or the discharge quality, the Contractor shall do corrective work at his/her own expense.

(7) Upon completion of the project, the Contractor shall submit the Notice of Cessation (CWB-NOC) form to the DOH and a copy of the submitted form to the DOW for information only.

D. COMPLETION OF DISCHARGE ACTIVITIES: At the conclusion of the discharge operations, the Contractor shall furnish the DOW with a signed affidavit indicating the date, location, volume, and treatment, if any, of all discharges. The location of storm drains, bodies of water, sewer manholes, and dry gulches shall be shown in relation to the discharge location.

E. VIOLATIONS: Violation citations for non-compliance shall be the responsibility of the Contractor. The Contractor shall pay all fines and hold harmless the Department of Water.

4.02 STORM WATER DISCHARGE:

A. GENERAL DESCRIPTION: This item of work shall include the furnishing of all labor, materials, tools, and equipment necessary for compliance with State of Hawai'i Department of Health regulations for discharges composed of storm water runoff associated with construction activity.

B. REGULATIONS:

(1) The Contractor shall be familiar with and meet the latest requirements of all applicable National Pollutant Discharge Elimination System (NPDES), State Department of Health (DOH), State Department of Transportation (DOT), and the Kaua'i County Department of Public Works (DPW) law, ordinances, rules, regulations and permits.

(2) The Contractor shall obtain all permits and licenses, pay all charges, fees, and taxes, give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified in the contract documents.

C. DETERMINATION: This project will not require the preparation of a construction site Best Management Practices (BMP) plan under the DOH NPDES regulations. The project affects a total land area less than the maximum disturbance area allowed for exemption from NPDES requirements. If the Contractor's work/staging area extends beyond the project work area, increasing the total disturbed land area beyond the maximum disturbance area allowed for exemption from NPDES requirements, the Contractor shall apply for and obtain an NPDES General Permit, Authorizing Discharges of Storm Water Associated with Construction Activity.

Note: Although storm water discharge NPDES is not required, the Contractor is still required to have construction site Best Management Practices (BMP) in place for the duration of the project.

D. PROCEDURES:

(1) The DOW has not applied for a Notice of General Permit Coverage (NGPC) to discharge stormwater associated with the construction activities from the project. The Contractor shall review the project and compile all documents required to complete

the Notice of Intent (NOI), Form C (NOI-C), if contractor deems necessary. The necessary information to complete the NOI-C must be filed at least 30 days prior to the start of any construction activities.

- (2) The Contractor is expected to comply with the conditions set forth in the permit. Any modifications or amendments to the permit by the Contractor shall be done at the Contractor's expense and no time extension will be granted. The Department of Water shall approve all modifications or amendments.
- (3) The Contractor shall make no claims for compensation due to delays or requirements imposed in obtaining an approved NPDES permit. Notice to Proceed will not be delayed due to Contractor's inability to attain an approved NPDES permit.
- (4) As required for the discharge of effluent, the Contractor shall also secure all other applicable State and County discharge and connection permits and pay all applicable fees. The Contractor shall fulfill all conditions of the Notice of General Permit Coverage and all other permits when issued. A copy of all approved permits, when issued, shall be provided to the Department of Water for information only.
- (5) The Contractor shall be responsible for monitoring, collecting samples, and having samples analyzed by a qualified laboratory and submit the analysis report to DOH. All costs shall be borne by the Contractor.
- (6) If the DOH is not completely satisfied with the Contractor's BMP plan or the discharge quality, the Contractor shall perform corrective work at their own expense.
- (7) Upon completion of the project, the Contractor shall submit the Notice of Cessation (CWB-NOC) form to the DOH and a copy of the submitted form to the DOW for information only.

E. Violations: Violation citations for non-compliance shall be the responsibility of the Contractor. The Contractor shall pay all fines and hold harmless the Department of Water.

4.03 MEASUREMENT AND PAYMENT: Payment for the work described herein shall not be made directly but shall be considered incidental to the various items of the Proposal and no additional compensation shall be made.

END OF SECTION

SECTION SP-5 STRUCTURAL WORK

TABLE OF CONTENTS FOR SECTION SP-5

<u>SECTION</u>	<u>DESCRIPTION</u>
5.1	STRUCTURAL DESIGN AND ANCHORAGE REQUIREMENTS FOR NONSTRUCTURAL COMPONENTS AND NONBUILDING STRUCTURES
5.2	CONCRETE WORK
5.3	UNIT MASONRY
5.4	REINFORCING STEEL
5.5	GROUT
5.6	ANCHORS

SECTION SP-5 STRUCTURAL WORK

SECTION SP-5.1 – STRUCTURAL DESIGN AND ANCHORAGE REQUIREMENTS FOR NONSTRUCTURAL COMPONENTS AND NONBUILDING STRUCTURES

5.1.01 GENERAL:

A. SCOPE:

- (1) This section specifies the minimum structural requirements for the design, anchorage and bracing of architectural/mechanical/HVAC/electrical components, equipment, and systems, and nonbuilding structures. Design of supports, attachments and bracing for all parts or elements of the architectural, mechanical, HVAC and electrical systems shall be provided in accordance with this section. The requirements of this section shall apply to the design of the structural elements and features of equipment.
- (2) This section applies to nonstructural components that are permanently attached to structures, and nonbuilding structures as defined below in paragraph 5.1.01-B and ASCE 7-05. Note that equipment is defined as a non-structural component and tanks are defined as a nonbuilding structure.
- (3) Design shall be in accordance with the criteria listed in the Structural General Notes Drawings and shall conform to the provisions of the design codes listed within this section. Engineering design is not required for attachments, anchorage, or bracing detailed on the drawings or where the size of attachments, anchorage, or bracing is defined in the technical specification sections.
- (4) The following nonstructural components are exempt from the seismic design loading requirements of this section.
 - a. Mechanical and electrical components in Seismic Design Category C provided that the component importance factor, I_p , is equal to 1.0.

B. DEFINITIONS:

- (1) Structures: The structural elements of a building that resist gravity, seismic, wind, and other types of loads. Structural components include columns, posts, beams, girders, joists, bracing, floor or roof sheathing, slabs or decking, load-bearing walls, and foundations.
- (2) Nonstructural components: The nonstructural portions of a building include every part of the building and all its contents, except the structural portions, that carry gravity loads and that may also be required to resist the effects of wind, snow, impact, temperature and seismic loads. Nonstructural components include, but are not limited to, ceilings, partitions, windows, equipment, piping, ductwork, furnishings, lights, etc.

- (3) Nonbuilding structures: All self-supporting structures that carry gravity loads and that may also be required to resist the effects of wind, snow, impact, temperature and seismic loads. Nonbuilding structures include, but are not limited to, pipe racks, storage racks, stacks, tanks, vessels and structural towers that support tanks and vessels.

5.1.02 QUALITY ASSURANCE:

- A. **QUALITY CONTROL BY DOW:** Special Inspection of nonstructural components and nonbuilding structures, and their anchorages shall be performed by the Special Inspector under contract with the DOW and in conformance with IBC Chapter 17. Special Inspector(s) and laboratory shall be acceptable to the DOW in their sole discretion. Special Inspection is in addition to, but not replacing, other inspections and quality control requirements herein. Where sampling and testing required herein conforms to Special Inspection standards, such sampling and testing need not be duplicated.
- B. **REFERENCES:**
- (1) Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly.
- (2) Unless otherwise specified, references to documents shall mean the documents in effect at the time of Advertisement for Bids or Invitation to Bid (or on the effective date of the Agreement if there were no Bids). If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization, or if there are no replacement documents, the last version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, regardless of whether the document has been superseded by a version with a later date, discontinued, or replaced. When conflicting requirements occur, the most stringent requirements will govern the design.

Reference	Title
AAMA	American Architectural Manufacturer's Association
ACI 318	Building Code Requirements for Structural Concrete
ACI 350	Code Requirements for Environmental Engineering Concrete Structures
AISC 341	Seismic Provisions for Structural Steel Buildings
ACI 360	Specification for Structural Steel Buildings
ASCE 7	Minimum Design Loads for Buildings and Other Structures
ASTM C635	Standard Specification for the Manufacture, Performance and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
ASTM C636	Standard Practice for Installation for Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings
AWS D1.1	Structural Welding Code – Steel

Reference	Title
AWS D1.2	Structural Welding Code - Aluminum
AWS D1.2	Structural Welding Code – Stainless Steel
IBC	International Building Code with local amendments
NFPA-13	Standard for the Installation of Sprinkler Systems
OSHA	U.S. Dept. of Labor, Occupational Safety and Health Administration
HIOSH	Hawaii Occupational Safety and Health Standards, Rules and Regulations
SMACNA	Seismic Restraint Manual Guidelines for Mechanical Systems

5.1.03 SUBMITTALS:

- A. For structural elements of nonstructural components and nonbuilding structures required to be designed per this specification section, drawings and design calculations shall be stamped by a Hawaii licensed professional engineer qualified to perform structural engineering.
- B. Submit drawings and calculations no less than twenty (20) working days in advance of the installation of any component to be anchored to the structure or installation of any structural member to which the component will be attached.
- C. The following submittals shall be provided:
 - (1) List of all nonstructural components and nonbuilding structures requiring wind and seismic design and anchorage.
 - (2) Shop drawings showing details of complete wind and seismic bracing and anchorage attachment assemblies including connection hardware, and embedment into concrete.
 - (3) Shop drawings showing plans, elevations, sections and details of equipment support structures and nonbuilding structures, including anchor bolts, structural members, platforms, stairs, ladders, and related attachments.
 - (4) Identify all interface points with supporting structures or foundations, as well as the size, location, and grip of all required attachments and anchor bolts. Clearly indicate who will be providing each type of attachment/anchor bolt. Equipment vendor shall design anchor bolts, including embedment into concrete, and submit stamped calculations.
 - (5) Calculations for all supports, bracing, and attachments shall clearly indicate the design criteria applied in the design calculations. Concrete embedment calculations shall be coordinated with thickness and strength of concrete members. Submit a tabulation of the magnitude of unfactored (service level) equipment loads at each support point, broken down by type of loading (dead, live, wind, seismic, operating equipment loads, etc.). Indicate impact factors applied to these loads in the design calculations.
 - (6) Manufacturer's certificates of compliance with the seismic force requirements of this section.

5.1.04 DESIGN CODES:

A. The following standard codes have application at this site for:

Buildings/Structures:	International Building Code 2006 and ASCE 7-05
Reinforced concrete:	ACI 318-05
Structural steel:	AISC 360-05 and AISC 341-05
Welding:	AWS Welding Codes, Latest Edition
Occupational health and safety requirements:	U.S. Dept. of Labor, Occupational Safety and Health Administration (OSHA)

B. When conflicting requirements occur, the most stringent requirements will govern the design.

5.1.05 DESIGN LOADS:

A. GENERAL: All nonstructural components and nonbuilding structures shall be designed for the loads shown on the Structural General Notes Drawing as well as the following:

B. IMPACT LOADS:

- (1) Impact loads shall be considered in the design of support systems.
- (2) The following impact load factors shall be used unless recommendations of the equipment manufacturer will cause a more severe load case.

Rotating machinery:	20% of moving load
Reciprocating machinery:	50% of moving load
Hangers supporting floors and platforms:	33% of live and dead load

C. TEMPERATURE: The effects of temperature shall be included in design where nonstructural components and nonbuilding structures are exposed to differential climatic conditions.

5.1.06 LOAD COMBINATIONS: All nonstructural components and nonbuilding structures shall be designed to withstand the load combinations as specified in the governing building code. Where the exclusion of live load or impact load would cause a more severe load condition for the member under investigation, then the load shall be ignored when evaluating that member.

5.1.07 FOUNDATIONS: Consult project drawings for allowable soil bearing recommendations at location of structure.

- 5.1.08 DEFLECTIONS: Maximum beam deflections as a fraction of span for walkways and platforms shall be L/240 for total load and L/360 for live load. Maximum total load deflection for equipment supports shall be L/450.
- 5.1.09 PRODUCTS: Materials shall be in conformance with information shown on the drawings and in other technical specification sections. See individual component and equipment specifications for additional requirements.
- 5.1.10 EXECUTION:
- A. Attachments and braces shall be made in such a manner that the component force is transferred to the lateral force-resisting system of the structure. Attachment requirements and size and number of braces shall be based on the calculations submitted by the Contractor.
 - B. All anchorage of equipment is specified to be made by cast-in anchor bolts in concrete elements unless specifically noted otherwise on the drawings or other specification Sections. Contractor shall be responsible for any remedial work or strengthening of concrete elements because of superimposed seismic loading if anchor bolts are improperly installed or omitted due to lack of submittal review or improper placement for any reason, at no additional cost to the DOW.
 - C. Anchor bolts shall be provided and installed by the Contractor in accordance with Section SP-5.6. Size of anchor bolts and embedment of anchor bolts shall be based on the calculations submitted by the Contractor.
 - D. Details of and calculations for all anchorages shall be submitted and accepted in accordance with paragraph 5.1.03 prior to placement of concrete or erection of other structural supporting members. Submittals received after structural supports are in place will be rejected if proposed anchorage method would create an overstressed condition of the supporting member. The Contractor shall be responsible for revisions to the anchorages and/or strengthening of the structural support so that there is no overstressed condition at no additional cost to the DOW.
- 5.1.11 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP 5.2 – CONCRETE WORK

5.2.01 DESCRIPTION: The work covered by this section includes providing all labor, materials, tools and equipment necessary for completing this item of work as specified in DIVISION 300-CONSTRUCTION, SECTION 303.03 CONCRETE WORK of the Water System Standards, dated 2002, and as modified or supplemented hereinafter.

5.2.02 SUBMITTALS: The following shall be submitted a minimum of twenty (20) working days prior to start of work under this section. Delays to the project due to inadequate submittals shall not be cause for additional payment.

- A. DESIGN DATA: Concrete Mix Design for each class of concrete
- B. Manufacturer's catalog data for the following items shall include printed instructions for admixtures, sealants, bonding agents, and epoxy-resin adhesive binders:
 - (1) Concrete Aggregates
 - (2) Portland Cement
 - (3) Joint Materials
 - (4) Concrete Curing Materials
- C. TEST REPORTS:
 - (1) Compressive Strength
 - (2) Slump

5.2.03 MATERIALS:

- A. CEMENT: All Portland cement shall conform to "Standard Specification for Portland Cement" (ASTM C150) for Type II, low alkali, containing less than 0.60 percent alkalis. The Contractor shall submit a certificate of a test with each lot of cement proposed for use on the project.
- B. CONCRETE AGGREGATES: Fine aggregate shall be hard, dense, durable particles of either sand or crushed stone regularly graded from coarse to fine. Gradation shall conform to ASTM C33, except percent passing by weight of number 100 sieve is modified to 2-12 percent.
- C. POZZOLAN:
 - (1) Pozzolan shall be Class F fly ash conforming to ASTM C618. Class C fly ash is not allowed. Pozzolan supplied during the life of the project shall have been formed at the same single source.
 - (2) The pozzolan color shall not substantially alter the resulting concrete from the normal gray color and appearance.

(3) Use pozzolan materials that are of the same brand and type and from the same plant of manufacture as the materials used in the concrete represented by the submitted field test records or used in the trial mixtures.

D. FORMWORK: Forms for all concrete surfaces exposed to view shall be APA High Density Overlay (HDO) Plyform Class I Exterior 48" X 96" X 3/4" minimum thickness. Forms for other concrete surfaces shall be APA Douglas Fir B-B Plyform Class I Exterior 48" X 96" X 3/4-inch minimum thickness.

E. Form ties shall be commercially fabricated for use in form construction and shall be constructed so that ends or end fasteners can be removed without causing spalling at surfaces of the concrete. Diameter on ends shall be 3/4 inch minimum to 1 inch maximum. Embedded portion of ties shall be not less than 1 1/2 inch from face of concrete after ends have been removed.

5.2.04 PROPORTIONING OF CONCRETE:

A. Concrete shall be normal weight concrete composed of cement, pozzolan, admixtures, aggregates, and water; proportioned and mixed to produce a workable, strong, dense, and impermeable concrete. It is acceptable to substitute interground Portland-pozzolan cement conforming to ASTM C595, containing the specified amount of pozzolan in lieu of Portland cement and pozzolan. Water-cementitious material (w/cm) ratio is based on the combined contents of cement and pozzolan.

B. Provide concrete mix designs in accordance with the following guidelines:

Concrete class	ASTM coarse aggregate size	Maximum water-cementitious materials (w/cm) ratio	Minimum cementitious materials content (pounds/CY)	Pozzolan, percent by weight of cementitious materials	Air content (percent)	Minimum ^a 28-day compressive strength, psi	Slump range (inches)
B	57 or 67	0.45	560	15-20 ^c	Not required	3000	3-5
C	57 or 67	0.40	560	15-20	Not required	4500	3-5
D	8	0.42	600	15-20 ^c	Not required	4000	3-5
E ^b	57	--	-	15-20 ^c	Not required	2000	4-8

^a Compressive strength shall be determined at the end of 28 days based on test cylinders made and tested in accordance with ASTM C39.

^b Concrete encasement for electrical conduit shall contain 3 pounds of red oxide per sack of cement.

^c Pozzolan use optional for this class of concrete.

- C. Concrete shall be provided by class for the corresponding use listed as follows:

Type of use	Class of concrete
Non-structural concrete (temporary working slabs, sidewalks, curbs, gutters, pavers, thrust blocks, manhole channels, pipe bedding, pipe encasement etc.) and fill concrete where noted on the design drawings	B
Typical cast-in-place structural concrete	C
Topping concrete	D
Electrical conduit encasement (duct banks) and concrete fill	E

5.2.05 EXECUTION:

A. PROTECTING AND CURING:

- (1) Do not use curing compound on concrete surfaces to be coated, waterproofed, moisture-proofed, tiled, roofed, or where other coverings are to be bonded. In these cases, use water curing unless the curing compound is first removed or is compatible with the final finish covering.
- (2) Maintain concrete surface temperature between 50 degrees F and 80 degrees F for at least 5 days. Cure concrete in hot weather (above 80 degrees F) in accordance with ACI 305.1.

B. SURFACE FINISHES:

(1) Slab Finish:

- a. The finishes specified herein include surface finishes, treatments and toppings for floors and slabs. Do not use dry cement on new concrete surfaces to absorb excess moisture. Round edges to a radius of 1/2 inch.
- b. Slope floors to drain uniformly within a room or space. Unless otherwise specified, slope shall be a minimum of 1/8 inch per foot toward nearest drain. Restrict use of floor drains with only locally depressed slabs to locations specifically noted.
- c. Immediately after final finish is applied, the surface shall be cured and protected as specified in Protecting and Curing paragraph above.
- d. Where finish is not specified, floor slabs shall receive a Steel Trowel Finish.

(2) Float Finish:

- a. Perform floating with a hand or power-driven float in accordance with ACI 301. Begin floating when the bleed water sheen has disappeared and the surface has

stiffened sufficiently. Float as required to meet tolerance requirements of ACI 117 for a conventional surface.

- b. Floating shall close cracks and checks plus compact and smooth the surface. Refloat the slab to a uniform texture.
- c. Apply float finish to surfaces of channels, tank bottom slabs, tops of footings, and surfaces to receive insulation or roofing.

(3) Steel Trowel Finish:

- a. Float the concrete surface as indicated above and then trowel in accordance with ACI 301.
- b. Provide Steel Trowel Finish on floors and walking surfaces unless specified otherwise.

5.2.06 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-5.3 – UNIT MASONRY

5.3.01 DESCRIPTION: The work covered by this section includes providing all labor, materials, tools and equipment necessary for completing masonry work consisting of reinforced concrete masonry construction. Masonry work shall be constructed from concrete masonry units in combination with reinforcing, mortar, and grout as specified in DIVISION 300- CONSTRUCTION, SECTION 303.13 Unit Masonry of the Water System Standards, dated 2002, and as modified or supplemented hereinafter.

5.3.02 SUBMITTALS: The following shall be submitted a minimum of twenty (20) working days prior to start of work under this section. Delays to the project due to inadequate submittals shall not be cause for additional payment.

A. CERTIFICATES:

- (1) Masonry unit certificates showing compliance to the specifications shall be submitted for each type of masonry unit.
- (2) Reinforcing certificates showing compliance to the specifications shall be submitted for reinforcing steel, including reinforcing steel wire and joint reinforcing

B. Manufacturer's catalog data for the following items. Clearly mark the data to indicate which type, size, or item the Contractor intends to provide. Data shall show conformance to specified requirements and Contractor's proposed usage details:

- (1) Masonry accessory
- (2) Premixed mortar
- (3) Masonry cement
- (4) Grout admixtures
- (5) Flashing

C. TEST REPORTS: Prism test results

D. SHOP DRAWINGS:

- (1) Reinforcing Steel: Detail bending and placement of masonry reinforcing bars. Comply with ACI SP-66.
- (2) Masonry Units: Details of all types of CMU units including, but not limited to corners, jamb units, lintels and bond beams.
- (3) Details of anchors, adjustable wall ties, positioning devices, and other accessories.

5.3.03 MATERIALS:

A. Hollow concrete masonry units. At both load-bearing and non-load-bearing walls shall

conform to ASTM C90, 115 pcf medium weight, with concrete masonry unit compressive strength as required to result in a concrete masonry compressive strength (f'_m) of 2,000 psi

- B. Cement. Portland cement conforming to the current ASTM C150, Type II, low alkali containing less than 0.60 percent alkalis.
- C. Mortar Admixture. Admixture specified DIVISION 300- CONSTRUCTION, SECTION 303.13 Unit Masonry of the Water System Standard shall be added to the mortar mix in accordance with manufacturer's specifications provided that the admixture does not adversely affect bonding or compressive strength.
- D. Masonry Cement. Do not use masonry cement.
- E. Mortar shall be freshly prepared and mixed in accordance with ASTM C270 to obtain type mortar specified. Where colored mortars are required, pigments may be added at the site or provided as part of prepackaged mortar mix.
- F. Grout aggregates shall conform to ASTM C404

5.3.04 EXECUTION:

A. Workmanship:

- (1) At corners of load bearing walls, provide a true masonry bond (true corner blocks finished on both face and end) in each course.
- (2) Use running bond throughout.
- (3) All cells shall be filled solidly with grout in lifts not exceeding eight feet.
- (4) Position and hold reinforcing before placing grout by tying or by using bar positioners at maximum 8-foot intervals. Use a vibrator to consolidate the grout. Minimum clear distance between masonry and vertical reinforcement shall be 1/2 inch. Reinforcement shall be doweled out to the minimum lap dimensions of 32 diameters as shown on design drawings.
- (5) At grout pours exceeding 5 feet 4 inches, provide cleanout inspection ports in bottom course at all vertical reinforcing bars.

5.3.05 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-5.4 – REINFORCING STEEL

- 5.4.01 DESCRIPTION: The work covered by this section includes providing all labor, materials, tools and equipment necessary for completing this item of work as specified in DIVISION 300-CONSTRUCTION, SECTION 303.04 REINFORCING STEEL of the Water System Standards, dated 2002, and as modified or supplemented hereinafter.
- 5.4.02 SUBMITTALS: The following shall be submitted a minimum of twenty (20) working days prior to start of work under this section. Delays to the project due to inadequate submittals shall not be cause for additional payment.
- A. SHOP DRAWINGS: Reinforcing steel shop drawings showing reinforcing steel bar quantities, sizes, spacing, dimensions, configurations, locations, mark numbers, lap splice lengths and locations, concrete cover and reinforcing steel supports.
- B. TEST REPORTS: Material certificates to verify all reinforcing conforms to ASTM A615, Grade 60
- 5.4.03 MATERIALS:
- A. BAR SUPPORTS:
- (1) Manufactured concrete block supports with embedded tie wires (wire dobies). Do not use brick, broken concrete masonry units, spalls, rocks, construction debris, or similar material for supporting reinforcing steel.
 - (2) Bar supports coming into contact with forms shall be CRSI Class 1 plastic protected or Class 2 stainless steel protected.
 - (3) Stainless steel or plastic protected plain steel supports shall be provided for other work.
- 5.4.04 PLACING: Reinforcing steel bars shall be supported and fastened together to prevent displacement by construction loads or concrete placement. For concrete placed on ground, furnish concrete block supports or metal bar supports with non-metallic bottom plates. For concrete placed against forms furnish plastic or plastic-coated metal chairs, runners, bolsters, spacers and hangers for the reinforcing steel bar support. Only tips in contact with the forms require a plastic coating.
- 5.4.05 SPLICING: Where splices are required use Class B splice lengths as noted on the Drawings.
- 5.4.06 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-5.5 – GROUT

5.5.01 DESCRIPTION: The work covered by this section includes providing all labor, materials, tools and equipment necessary for grout used for structural support bases, equipment bases, crack repair, surface repair and uses other than masonry. Grout for masonry is specified in Section SP-5.3.

5.5.02 SUBMITTALS: The following shall be submitted a minimum of twenty (20) working days prior to start of work under this section. Delays to the project due to inadequate submittals shall not be cause for additional payment.

- A. Complete product literature and installation instructions for the following: Cementitious non-shrink grout, epoxy grout, adhesive for dowel and anchor setting, and concrete repair mortar products to be used on the project.
- B. Current ICC Evaluation Report for adhesives used for dowel and anchor setting.
- C. Installer certification in accordance with ACI/CRSI Adhesive Anchor Installer Certification Program for installers of horizontal or upwardly inclined adhesive anchors.

5.5.03 MATERIALS:

- A. Cementitious nonshrink nonmetallic aggregate grout shall be Five Star Products, Inc. Five Star Grout, Master Builders Masterflow 928, Burke Company Non-Ferrous, Non-Shrink Grout, Hi-Flow Grout by Euclid Chemical Company, or approved substitute.
- B. Epoxy grout for equipment mounting shall be a non-cementitious, resin based, multi-component formulation. Epoxy grout shall be flowable, with shrinkage minimized to achieve minimum 98% effective bearing area. Epoxy grout shall be Masterflow 648 CP Plus by Masterbuilders; Sikadur 42 by Sika Corporation; E3-G by Euclid Chemical Company; or approved substitute.
- C. ADHESIVE FOR DOWEL AND ANCHOR SETTING:
 - (1) Adhesive for setting dowels and anchoring connection/base plate bolts shall be an injectable two-component epoxy adhesive. Adhesive shall be approved for the intended use per the product ICC Report.
 - (2) Adhesive shall be HIT-RE 500V3 by Hilti or approved substitute for anchoring into concrete (equivalent product must have ICC approval for use in cracked concrete in areas with high seismic risk).
 - (3) Adhesive shall be HIT-HY 70 with HIT-SC sleeve (sleeve for use if masonry wall is ungrouted) by Hilti or approved substitute for anchoring into concrete masonry walls (equivalent product must have ICC approval for use in areas with high seismic risk).
- D. CONCRETE REPAIR MORTAR:
 - (1) Horizontal Applications: Horizontal repair mortars shall be MasterEmaco S 466CI by BASF, SikaTop 111 Plus by Sika Corp, or approved substitute.

- (2) Vertical and Overhead Applications: Vertical and overhead repair mortars shall be SikaTop 123 Plus by Sika Corp, MasterEmaco 1500HCR Vertical Overhead by BASF or approved substitute.

5.5.04 EXECUTION:

A. CEMENTITIOUS NONSHRINK GROUT:

- (1) Nonshrink, cementitious, nonmetallic aggregate grout shall be used for column base plates, structural bearing plates, and all locations where the general term “non-shrink grout” is indicated on the Drawings. Use of this grout to support the bearing surfaces of machinery shall as detailed on the Drawings for specific locations or pieces of equipment. If guidance is not provided in locations noted above, use of non-shrink grout for equipment mounting shall be limited to equipment less than 25 horsepower or 750 pounds. Grout shall be placed and cured in accordance with manufacturer’s instructions.
- (2) Nonshrink cementitious grout shall not be used as a surface patch or topping. Nonshrink cementitious grout must be used in confined applications only.

B. EPOXY GROUT FOR EQUIPMENT MOUNTING: Prepare concrete surfaces of equipment pads as indicated in details on the Drawings and as required by the epoxy grout manufacturer. Epoxy grout for equipment mounting shall be placed and cured in accordance with details on the Drawings and in conformance with manufacturer’s recommendations.

C. CONCRETE REPAIR MORTAR:

- (1) Concrete repair materials and procedures shall be submitted for review to the DOW and shall be accepted prior to commencement of the repair work.
- (2) Follow all manufacturers’ instructions, including those for minimum and maximum application thickness, surface preparation and curing. Add aggregate as required per manufacturer's recommendations. Any deviations from the manufacturer’s instructions shall be submitted for review to the DOW and shall be accepted prior to commencement of the work.
- (3) Where mortar will be in direct contact with sewage or sewage gases, the aggregate shall contain no coral sand.

5.5.05 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-5.6 – ANCHORS

5.6.01 DESCRIPTION: The work covered by this section includes providing all labor, materials, tools and equipment necessary for bolts and all-thread rods used to attach structural elements and equipment to concrete and concrete masonry. Included are cast-in-place and post-installed anchors (adhesive systems and wedge type expansion anchors), nuts and washers.

5.6.02 SUBMITTALS: The following shall be submitted a minimum of twenty (20) working days prior to start of work under this section. Delays to the project due to inadequate submittals shall not be cause for additional payment.

- A. Anchor bolt placement plans.
- B. Anchor rod, nut and washer material information, including material certifications.
- C. Where required by other sections of the Contract Documents, design calculations and details showing the required diameter, length, embedment, edge distance, confinement, anchor reinforcement, anchor bolt sleeves and other conditions, stamped and signed by a currently licensed State of Hawaii Professional Engineer. Calculations shall comply with the provisions of ACI 318 Appendix D.
- D. PRODUCT DATA:
 - (1) ICC Evaluation Service Reports for post-installed adhesive type anchors and expansion (wedge type) anchors when allowed.
 - (2) Data indicating load capacities.
 - (3) Chemical resistance.
 - (4) Temperature limitations.
 - (5) Installation instructions:

5.6.03 MATERIALS:

- A. Anchor bolt materials shall be as specified in Table A.

Table A. Anchor Bolt Materials

Material	Specification
Anchor Bolts	Stainless Steel ASTM A193, Grade B8M Class 1, AISI 316 or ASTM A320, Grade B8M Class 1, AISI 316
Threaded Rods	Stainless Steel ASTM F593 Group 2 Type 316 SS CW

Material	Specification
Nuts and Washers	Stainless Steel ASTM A194 Heavy Hex Nuts and Washers, Type 316
Concrete Expansion Anchors	ASTM F594 Heavy Hex Nuts at Adhesive Anchors, Type 316 Stainless Steel HILTI "KWIK BOLT TZ", or equal
Concrete Adhesive Anchoring System	HILTI HIT-RE 500 V3, or equal, with Type 316 Stainless Steel threaded rods
Masonry Expansion Anchors	Stainless Steel HILTI "KWIK BOLT 3", or equal
Masonry Adhesive Anchoring System	Hilti "HIT-HY 70", Simpson "SET", or approved equal, with Type 316 Stainless Steel threaded rods

B. STAINLESS STEEL NUT COATINGS:

- (1) Stainless steel nuts shall be provided with Tripac 2000 Blue coating, or approved substitute.
- (2) Prepare nut surface by chemically cleaning, abrasive blasting, priming and baking in accordance with Manufacturer's recommendations.
- (3) Apply multiple coats of No. 1424 fluoropolymer coating and bake in accordance with Manufacturer's recommendations.

5.6.04 EXECUTION:

- A. Anchor bolts for equipment frames and foundations shall be designed for seismic and wind forces calculated from design criteria provided on Structural General Notes drawing.
- B. Grouting of anchor bolts with nonshrink or epoxy grouts, where specified, shall be in accordance with Section SP-5.5.
- C. CAST-IN-PLACE ANCHOR BOLTS:
 - (1) Anchor bolts to be embedded in concrete shall be placed accurately and held in correct position while the concrete is placed. The surfaces of metalwork in contact with concrete shall be thoroughly cleaned.
 - (2) After anchor bolts have been embedded, their threads shall be protected by grease and the nuts run on.
 - (3) Provide heavy hex headed type unless shown otherwise on the Drawings.

- (4) Provide 3/4-inch minimum diameter with sufficient length for 10-inch embedment unless noted otherwise in the Contract Documents or accepted equipment anchor submittals.
- (5) Grout pads shall not be included in embedment length.

D. ADHESIVE ANCHORS:

- (1) Anchor diameter and grade of steel shall be per contract documents or per equipment manufacturer specifications. Anchor shall be threaded or deformed full length of embedment and shall be free of rust, scale, grease, and oils.
- (2) All installation recommendations by the anchor system manufacturer shall be followed carefully, including maximum hole diameter embedment.
- (3) Holes shall have rough surfaces created by using a hammer drill and carbide bit (core drilled holes are not allowed).
- (4) Holes shall be blown clean with oil-free compressed air and be free of dust or standing water prior to installation. Follow additional requirements of the adhesive manufacturer.
- (5) Anchor shall be left undisturbed and unloaded for full adhesive curing period.
- (6) Concrete temperature (not air temperature) shall be compatible with curing requirements of adhesives per adhesive manufacturer. Anchors shall not be placed in concrete below 25 degrees F.
- (7) Reinforcing steel in masonry shall not be damaged.

5.6.05 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-6 ARCHITECTURAL WORK

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6.5	SEALANTS
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SECTION SP-6.1 – LOUVERS

6.1.01 SUMMARY:

- A. Furnish and install louvers, bird screens, structural supports and attachment brackets as shown on the drawings, as specified, and as needed for a complete and proper installation.
- B. The louvers to be furnished include the following:
 - (1) Drainable fixed extruded louvers as necessary.
 - (2) Insect Screen on interior of louver frame.
 - (3) Louvers to be rated for wind load of 130 PSF.

6.1.02 REFERENCES:

- A. Air Movement and Control Association (AMCA) International, Inc.
 - (1) AMCA Standard 500-L-99 Laboratory Methods of Testing Louvers for Rating
 - (2) AMCA Publication 501 Application Manual for Louvers
- B. The Aluminum Association Incorporated
 - (1) Aluminum Standards and Data
 - (2) Specifications and Guidelines for Aluminum Structures
- C. American Society of Civil Engineers
 - (1) Minimum Design Loads for Buildings and Other Structures
- D. American Society for Testing and Materials (ASTM)
 - (1) ASTM B209
 - (2) ASTM B211
 - (3) ASTM B221
 - (4) ASTM E90-90
- E. Architectural Aluminum Manufacturers Association (AAMA)
 - (1) AAMA 800 Voluntary Specifications and Test Methods for Sealants

(2) AAMA 605.2 Voluntary Specification for High Performance Organic Coatings on Aluminum Extrusions and Panels

(3) AAMA TIR Metal Curtain Wall Fasteners

(4) AAMA 2605-98 Superior Performing Organic Coatings on Aluminum Extrusions and Panels

F. Canadian Standards Association

(1) CAN3-S157-M83 Strength Design in Aluminum

(2) S136 94 Cold Formed Steel Structural Members

6.1.03 SUBMITTALS:

A. PRODUCT DATA:

(1) Air flow and water entrainment performance test results.

(2) Material types and thickness.

B. SHOP DRAWINGS:

(1) Include elevations, sections and specific details for each louver.

(2) Show anchorage details and connections for all component parts.

(3) Include signed and sealed structural calculations.

C. SAMPLES: Submit for approval at least twenty (20) working days prior to ordering.

D. COLOR CHIPS: Submit for approval at least twenty (20) working days prior to ordering.

6.1.04 QUALITY ASSURANCE:

A. SINGLE SUBCONTRACT RESPONSIBILITY: Subcontract the work to a single firm that has had not less than six years' experience in the design and manufacturing of work similar to that shown and required.

B. PERFORMANCE REQUIREMENTS: Provide AMCA and Building Services Research and Information Association (BSRIA) test data as required to confirm that the louvers have the specified air and water performance characteristics.

C. ACOUSTICAL PERFORMANCE: Where applicable, submit test reports to confirm that the louvers meet the specified STC and Noise Reduction requirements.

D. STRUCTURAL REQUIREMENTS: Design all materials to withstand wind loads as

required by the applicable building code. Maximum allowable deflection for the louver structural members to be 1/180 or 0.75 inch, whichever is less. Maximum allowable deflection for the louver blades to be 1/120 or 0.50 inch across the weak axis, whichever is less.

- E. PROFESSIONAL ENGINEER REQUIREMENTS: Drawings and structural calculations to be signed and sealed by a professional engineer licensed to practice in the state of Hawai'i.
- F. WARRANTY: Provide written warranty to the DOW that all products will be free of defective materials or workmanship for a period of one year from date of installation.

6.1.05 DELIVERY, STORAGE AND HANDLING:

- A. DELIVERY: At the time of delivery all materials shall be visually inspected for damage. Any damaged boxes, crates, louver sections, etc. shall be noted on the receiving ticket and immediately reported to the shipping company and the material manufacturer.
- B. STORAGE:
 - (1) Material may be stored flat, on end or on its side.
 - (2) Material may be stored either indoors or outdoors.
 - (3) If stored outdoors the material must be raised sufficiently off the ground to prevent it from being flooded.
 - (4) If stored outdoors the material must be covered with a weather-proof flame-resistant sheeting or tarpaulin.
- C. HANDLING:
 - (1) Material shall be handled in accordance with sound material handling practices and in such a way as to minimize racking.
 - (2) Louver sections may be hoisted by attaching straps to the jambs and lifting the section while it is in a vertical position.
 - (3) Louver sections should only be lifted and carried by the jambs. Heads, sills and blades are not to be used for lifting or hoisting louver sections.

6.1.06 MANUFACTURERS:

- A. The louvers and related materials herein specified and indicated on the drawings shall be as manufactured by:

Construction Specialties, Inc.
49 Meeker Avenue,

Cranford, New Jersey 07016
Telephone: 800-631-7379

Construction Specialties, LTD.
895 Lakefront Promenade,
Mississauga, Ontario L5E 2C2
Telephone: 888-895-8955

Dayton by W.W. Grainger, Inc.
Honolulu Branch #561
2833 Paa Street
Honolulu, HI 96819-4406
Telephone: 800-472-4643

Ruskin™
3900 Dr. Greaves Rd.
Kansas City, MO 64030
Telephone: 816-761-7676

- B. Products equal to the above materials may be offered providing that the manufacturer and materials are pre-approved at least twenty (20) working days before the bid date. Equivalence shall be demonstrated by submission of complete data to the DOW including drawings and descriptions of products, fabrication details, product samples where applicable or requested and installation procedures. List of substitute material together with qualifying data shall be submitted for approval at least ten days before bid opening. Any variations shall be specifically identified and justified for substitution. Incomplete submittals will be rejected.

6.1.07 MATERIALS:

- A. Aluminum Extrusions: ASTM B211, Alloy 6063-T5, 6063-T6 or 6061-T6.
B. Aluminum Sheet: ASTM B3209, Alloy 1100, 3003 or 5005.

6.1.08 FABRICATION, GENERAL:

- A. Provide C/S louver models, bird screens, structural supports and accessories as specified and/or shown on the drawings. Materials, sizes, depths, arrangements and material thickness to be as indicated or as required for optimal performance with respect to strength; durability; and uniform appearance.
B. Louvers to be mechanically assembled using stainless steel or aluminum fasteners.
C. Include supports, anchorage, and accessories required for complete assembly.

6.1.09 LOUVER MODELS:

- A. C/S 4" (101.6mm) Deep High Performance Drainable Fixed Extruded Mullion Louver Model A4097

- (1) Material: Heads, sills, jambs and mullions to be one-piece structural aluminum members with integral caulking slot and retaining beads. Mullions shall be sliding interlock with internal drains. Blades to be one-piece aluminum extrusions with gutter(s) designed to catch and direct water to jamb and mullion drains. Closed cell PVC compression gaskets shall be provided between bottom of mullion or jamb and top of sill to insure leak tight connections. Material thickness to be as follows: Heads, sills, jambs and mullions: 0.081" (2.06mm). Fixed blades 0.081" (2.06mm).
- (2) AMCA Performance: A 4' x 4' unit shall conform to the following and be licensed to bear the AMCA seal:

Free Area 8.07 sq. ft. (0.750 sq. m.)
 Free area velocity at the point of beginning water penetration 1040
 FPM (317.0 m/min)

Intake Pressure drop at the point of beginning water penetration 0.20 in.
 H₂O (5.08 mm) Exhaust pressure drop at 1000 fpm free area velocity
 (305 m/min) 0.18 in. H₂O (4.67 mm)

6.1.10 FINISHES:

- A. GENERAL: Comply with National Association of Architectural Metal Manufacturers (NAAMM) "Metal Finishes Manual" for finish designations and application recommendations, except as otherwise indicated. Apply finishes in factory. Protect finishes on exposed surfaces prior to shipment. Remove scratches and blemishes from exposed surfaces that will be visible after completing finishing process. Provide color as indicated or, if not otherwise indicated, as selected by architect.
- B. THREE COAT PEARLESCENT FLUOROCARBON COATING:
 - (1) Louvers to be finished with a minimum 1.4 mil (0.035mm) thick full strength 70% resin, 3 coat Fluoropolymer system.
 - (2) All aluminum shall be thoroughly cleaned, etched and given a chromated conversion pretreatment before application of the Kynar/Hylar coating. The coating shall consist of a primer, a high metallic color coat and a clear PVF2 topcoat. It shall receive a bake cycle of 17 minutes at 4500F. All finishing procedures shall be one continuous operation in the plant of the manufacturer.
 - (3) Manufacturer to furnish an extended 20 year limited warranty for the Kynar/Hylar coating. This limited warranty shall begin on the date of material shipment.

OR

- C. CLEAR ANODIZE:

- (1) Louvers to be given a one hour 215R1 Architectural Class I anodic coating of 0.7 mil (0.018mm) thickness (Aluminum Association designation AA-C22A41).
- (2) The thickness of the coating shall be tested in accordance with ASTM B244-68.
- (3) The coating shall be sealed to pass the ASTM B136-77 Modified Dye Stain Test.

6.1.11 BIRD/INSECT SCREENS:

- A. Unless otherwise indicated, all louvers to be furnished with mill finish bird and insect screens.
- B. Bird Screens to be McNichols 1/4" opening perforated panels, secured within 0.055" (1.40mm) thick extruded aluminum frames. Frames to have mitered corners and corner locks.
- C. Insect Screens to be aluminum mesh 0.011" (0.279mm) diameter wire insect screens secured within 0.055" (1.40mm) thick extruded aluminum frames. Frames to have mitered corners and corner locks.

6.1.12 EXAMINATION: Examine openings to receive the work. Do not proceed until any unsatisfactory conditions have been corrected.

6.1.13 INSTALLATION:

- A. Comply with manufacturer's instructions and recommendations for installation of the work.
- B. Verify dimensions of supporting structure at the site by accurate field measurements so that the work will be accurately designed, fabricated and fitted to the structure.
- C. Anchor louvers to the building substructure as indicated on architectural drawings. Use stainless steel or other compatible anchor materials. Do not use aluminum anchors in concrete or masonry walls.
- D. ERECTION TOLERANCES:
 - (1) Maximum variation from plane or location shown on the approved shop drawings: 1/8" per 12 feet of length, but not exceeding 1/2" in any total building length or portion thereof (noncumulative).
 - (2) Maximum offset from true alignment between two members abutting end to end, edge-to edge in line or separated by less than 3":1/16" (shop or field joints). This limiting condition shall prevail under both load and no load conditions.
- E. Cut and trim component parts during erection only with the approval of the manufacturer or fabricator, and in accordance with his recommendations. Restore finish completely. Remove and replace members where cutting and trimming has impaired the strength or

appearance of the assembly.

- F. Do not erect warped, bowed, deformed or otherwise damaged or defaced members. Remove and replace any members damaged in the erection process as directed.
- G. Set units level, plumb and true to line, with uniform joints.

6.1.14 PROTECTION: Protect installed materials to prevent damage by other trades. Use materials that may be easily removed without leaving residue or permanent stains.

6.1.15 ADJUSTING AND CLEANING:

- A. Immediately clean exposed surfaces of the louvers to remove fingerprints and dirt accumulation during the installation process. Do not let soiling remain until the final cleaning.
- B. Before final inspection, clean exposed surfaces with water and a mild soap or detergent not harmful to the material finishes. Thoroughly rinse surfaces and dry.
- C. TOUCH-UP: Restore louvers and accessory components damaged during installation and construction so no evidence remains of corrective work. If results of restoration are unsuccessful, as determined by the Architect, remove damaged materials and replace with new materials.

- (1) Touch up minor abrasions in finishes with a compatible air-dried coating that matches the color and gloss of the factory applied coating.

6.1.16 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-6.2 – COILING DOORS

- 6.2.01 SUMMARY: Furnish and install two (2) coiling doors and all appurtenances as shown on the drawings, as specified, and per manufacturer's specifications.
- 6.2.02 REFERENCES: American Society for Testing and Materials (ASTM) A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galv-annealed) by the Hot-Dip Process.
- 6.2.03 SUBMITTALS:
- A. **PRODUCT DATA**: Manufacturer's data sheets on each product to be used, including:
 - (1) Preparation instructions and recommendations.
 - (2) Storage and handling requirements and recommendations.
 - (3) Installation methods.
 - B. **SHOP DRAWINGS**: Provide drawings indicating track details, head and jamb conditions, spring shafts, anchorage, accessories, finish colors, patterns and textures, operator mounts and other related information.
 - C. **REGULATORY REQUIREMENTS AND APPROVALS**: Provide shop drawings in compliance with local Authority Having Jurisdiction (AHJ).
 - D. **CERTIFICATIONS**: Submit manufacturer's certificate that products meet or exceed specified requirements.
 - E. Submit installer qualifications.
 - F. **SELECTION SAMPLES**: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
 - G. **VERIFICATION SAMPLES**: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
- 6.2.04 QUALITY ASSURANCE: **Installer Qualifications**: Utilize an installer having demonstrated experience on projects of similar size and complexity, and trained and authorized by the door manufacturer to perform the work of this section.
- 6.2.05 DELIVERY, STORAGE, AND HANDLING: Store products in manufacturer's unopened packaging until ready for installation. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
- 6.2.06 PROJECT CONDITIONS: Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

6.2.07 MANUFACTURERS: Raynor, or approved equal. Requests for substitutions will be considered in accordance with provisions of Section SP 1.7.

6.2.08 COILING AND ROLLING DOORS:

- A. DuraCoil Basic as manufactured by Raynor Garage Doors or approved equal.
- B. OPERATION: Provide doors designed for electric motor operation with the option for manual operation as back-up.
- C. DRIVE ORIENTATION: Orient the drive from the following side when facing the side of the door that has the counterbalance or hood exposed:
Right-hand.
- D. STRUCTURAL PERFORMANCE REQUIREMENTS: Wind Loads: Uniform pressure of 26 psf.
- E. CURTAIN MATERIAL: Flat interlocking steel slats, 24-gauge (0.023-inch minimum steel thickness), roll-formed from commercial quality hot-dipped galvanized (G-60) steel in compliance with ASTM A-653.
- F. MOUNTING: To face of wall on each side of door opening.
- G. COLOR AND FINISH: One finish coat of polyester paint applied over one coat of white epoxy primer. Provide color options.
- H. ENDLOCKS: Zinc-plated stamped steel fastened with two zinc-plate steel rivets.
- I. BOTTOM BAR AND SEAL: Two roll-formed galvanized steel angles, minimum 1-1/2 inches by 1-1/2 inches by 1/8 inch (38.1 mm x 38.1 mm x 3.2 mm) with single-contact type bottom astragal.
- J. COUNTERBALANCE SYSTEM:
 - (1) Headplates: 10-gauge galvanized steel plate, attached to wall angle of guide assembly with 1/2-inch (12.7 mm) diameter class 5 case hardened bolts. Inside of drive bracket fitted with sealed ball bearing.
 - (2) Barrel: Minimum 4-1/2 inches (114.3 mm) O.D. and 0.120-inch (3.1 mm) wall thickness structural steel pipe. Deflection of pipe under full load shall not exceed 0.03 inch (0.8 mm) per foot of span.
 - (3) Torsion Spring: Oil-tempered counterbalance with helical torsion springs, grease packed and mounted on a continuous steel torsion shaft.
- K. ENCLOSURES:
 - (1) Round Hood: 24-gauge steel, finish-painted to match curtain.
 - (2) Weight Counterbalance Cover: 24-gauge steel, finish-painted to match curtain.

(3) Hood Baffle: Provide EPDM rubber seal to inhibit air infiltration through hood cavity.

(4) Headplate Cover: 24-gauge steel, finish to match curtain.

(5) Weather Seal: Guide brush seal.

L. LOCKING BAR FOR MOTOR OPERATED DOORS: Provide interlock switch with locking bar.

M. CYLINDER LOCK FOR MOTOR OPERATED DOORS: Provide interlock switch with cylinder lock.

6.2.09 EXAMINATION:

A. Do not begin installation until substrates have been properly prepared. Verify that site conditions are acceptable for installation of doors, operators, controls and accessories.

B. Ensure that openings are square, flush and plumb. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

6.2.10 PREPARATION: Clean surfaces thoroughly prior to installation. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

6.2.11 INSTALLATION: Install door, track and operating equipment complete with all necessary accessories and hardware according to shop drawings, manufacturer's instructions. Lubricate bearings and sliding parts, assure weather tight fit around door perimeter and adjust doors for proper operation, balance, clearance and similar requirements.

6.2.12 PROTECTION:

A. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove and legally dispose of construction debris from project site.

B. Remove temporary coverings and protection of adjacent work areas. Repair or replace installed products damaged prior to or during installation.

C. Protect installed products until completion of project.

D. Touch-up, repair or replace damaged products before Substantial Completion.

6.2.13 FIELD QUALITY CONTROL: Provide manufacturer's field service, consisting of product installation and use recommendations, and a minimum of one (1) field site visit to observe and ensure product installation is done in accordance with manufacturer's recommendations.

6.2.14 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation

for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-6.3 – METAL DOORS & FRAMES

6.3.01 SECTION INCLUDES:

- A. Rolled steel door frames, welded construction, for exterior door openings.
- B. Flush, hollow steel doors.

6.3.02 RELATED SECTIONS:

- A. Section 6.4 – Finish Hardware.
- B. Section 6.7 – Painting: Field painting of steel doors and frames.

6.3.03 SUBMITTALS:

A. SHOP DRAWINGS:

- (1) Submit shop drawings and schedules for doors and frames.
- (2) Indicate frame configuration, anchor types and spacing, location of cutouts for hardware, reinforcement, and finish.
- (3) Indicate door elevations, internal reinforcement and closure method.
- (4) Coordinate submittal with Section SP-6.4
- (5) Finish Hardware and Door Hardware Schedule.

6.3.04 QUALITY ASSURANCE:

- A. **INDUSTRY STANDARDS:** Steel doors and frames, and their installation, shall conform to the following requirements of the Steel Door Institute:
 - (1) ANSI/SDI-100 - Standard Steel Doors and Frames.
 - (2) ANSI/SDI-1-5 - Recommended Erection Instructions for Steel Frames.

6.3.05 MATERIALS:

- A. **SHEET STEEL FOR DOORS AND FRAMES:** Prime quality cold rolled, annealed, stretcher leveled steel, conforming to Commercial Standard CS 242 or CS 211, with bonderized finish.
- B. **HOT-ROLLED STEEL SHEETS AND STRIP:** Commercial quality carbon steel, pickled and oiled, complying with ASTM A569 and ASTM A568.
- C. **COLD-ROLLED STEEL SHEETS:** Commercial quality carbon steel, complying with ASTM A366 and ASTM A568.

- D. GALVANIZED STEEL SHEETS: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A526, or drawing quality, ASTM A642, hot dipped galvanized in accordance with ASTM A526, with G60 or G90 coating designation, mill phosphatized.

6.3.06 ROLLED STEEL FRAMES, WELDED CONSTRUCTION:

- A. ROLLED STEEL (HOLLOW METAL) FRAMES: Full-formed sheet steel, concealed fastenings, welded construction, SDI 100 or equivalent custom fabricated frames conforming to referenced NAAMM standards.
- B. SHAPES: As scheduled and indicated on Drawings.
- C. STEEL: Galvanized steel, 16-gauge typically, ASTM A526, Coating Designation G60.
- D. REINFORCEMENTS: Provide in accordance with SDI 107.
- E. CUTOUTS: Provide factory-prepared cutouts from hardware instructions and templates. Refer to Section SP-8.11 - Finish Hardware. Prepare cutouts with fully drilled and tapped fittings.
- F. ANCHORS: Provide in accordance with SDI 105.

6.3.07 HARDWARE PREPARATION:

- A. HARDWARE PREPARATION, GENERAL: Conform to SDI 107, SDI 109 and ANSI A115.1 through A115.14.
- B. REINFORCEMENT: SDI 100, Table IV.
- C. HARDWARE LOCATIONS: SDI 100.
- D. LOCK STRIKES: Set out for proper clearance for silencers, weather stripping and sound seals.
- E. PREPARATION FOR CONTACTS FOR SECURITY ALARM SYSTEM: At doors identified by DOW to have alarm contacts, factory prepare door frames provide to suit alarm contact.

6.3.08 INSTALLATION:

- A. WELDED STEEL FRAMES INSTALLATION:
 - (1) Install frames in conformance to ANSI/SDI-100 and ANSI/SDI-105. Comply with requirements for fire- rated assembly.
 - (2) Install frame solid in the wall, plumb and square, with proper opening width and height.
 - (3) Fasten clip angles to floor construction and brace frames so as to retain their position and clearance during construction of adjacent Work.

(4) Install anchors for stud partitions on hinge jamb immediately above each hinge reinforcing plate and below the top hinge reinforcement (minimum 4 per jamb) and locate anchors directly opposite on the strike jamb.

B. DOORS INSTALLATION, GENERAL: Comply with manufacturer's instructions and recommendations and to ANSI/SDI-100 and ANSI/SDI-1-5. Hang doors and adjust for proper clearances and operation. Refer to drawing set for hardware requirements.

C. REPAIRS:

(1) Make repairs only if permitted by DOW. Otherwise, replace damaged components with new.

(2) Fill surface depressions with metallic paste filler in compliance with manufacturer's recommendations, allow to thoroughly cure, sand flush, and smooth for an invisible appearance with adjacent metal surfaces.

(3) Sand smooth all rusted areas.

(4) Apply touch-up paint using air drying primer compatible with shop-applied finish.

6.3.09 ADJUSTING:

A. OPERATION: Rehang or replace doors which do not swing or operate freely.

(1) Non-rated doors: Doors without closers shall hang straight and still; hardware shall operate smoothly.

B. CHECKING AND ADJUSTING: Check and readjust operations of all door and hardware immediately prior to Substantial Completion Review.

C. REMEDIAL WORK: Immediately remove and replace, at no change in Contract Time or Contract Sum, all damaged, misaligned and warped doors.

6.3.10 CLEANING AND PROTECTION:

A. PRIME COAT TOUCH-UP: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

B. PROTECTION: Protect installed doors and frames from damage. Remove protection for Substantial Completion review.

C. FINAL ADJUSTMENTS: Check and readjust operating hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

D. CLEANING: Clean doors and frames of surface contaminants detrimental to bonding of field applied finishes.

6.3.11 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material,

equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-6.4 – FINISH HARDWARE

6.4.01 DESCRIPTION:

- A. The work covered under this section shall include the furnishing of all labor, materials, tools and equipment necessary for completing this item of work as specified in DIVISION 300-CONSTRUCTION, SECTION 303.24 FINISH HARDWARE of the Water System Standards, dated 2002 and as modified or supplemented hereinafter.
- B. Furnish and deliver to the building site, all finishing hardware required for all doors, etc., complete as indicated on the drawings and as specified herein.
- C. It is the intent of these specifications to cover in general the class and character of all finish hardware required.
- D. The hardware list specified hereinafter has been made for the convenience of the Contractor and covers in general the necessary hardware for doors, casework, etc., but all other doors, etc., shown on the plan and not covered by the general characterization shall be fitted with appropriate hardware of the same standards as the hardware described throughout these specifications. Contractor shall furnish hardware schedule as hereinafter specified.
- E. Equivalent products of other manufacturers will be considered in accordance with the “or approved equal” provision. Equivalence shall be demonstrated by submission of complete data to the DOW including drawings and descriptions of products, fabrication details, product samples where applicable or requested and installation procedures. List of substitute material together with qualifying data shall be submitted for approval at least ten days before bid opening. Any variations shall be specifically identified and justified for substitution. Incomplete submittals will be rejected.

6.4.02 SUBMITTALS:

- A. **SCHEDULE:** Furnish one hard copy and one electronic copy of the schedule of hardware in compliance with specifications and drawings. List each opening and hardware to be applied. State keying, material, finish and manufacturer's number for each item. Required types are listed. Verify keying system used by DOW as well as keying hierarchy. Verify number of keys and hierarchy level required.
- B. **MANUFACTURER’S DATA:** Submit manufacturer’s descriptive literature along with schedule for information only.

6.4.03 DELIVERY:

- A. Examine the plans, specifications, and details in order to check all items so they will be suitable and of perfect fit and delivered where and when required. Certify schedule for same or bring to the attention of the architect prior to ordering materials.
- B. All hardware for the particular door shall be delivered at the site, packed separately with all trimmings, screws, etc., and properly labeled and numbered so that they can be checked with the included hardware list.

C. Upon delivery of the finishing hardware to the job site by the hardware supplier, the General Contractor shall have a responsible person check in the material at the place for storage. The hardware shall be protected from damage at all times, both prior to and after installation.

6.4.04 REPRESENTATIVE: Provide services of a competent hardware specialist who is familiar with installation and operation of all finishing hardware items furnished. Representative shall be available for jobsite inspections and consultation as directed by the architect.

6.4.05 QUALITY ASSURANCE: Hardware supplier shall be a Hawai'i company specializing in architectural finish hardware for a period of not less than three (3) years. Supplier shall maintain local inventory of all products furnished for this project. Certify all submittals for quality assurance.

6.4.06 MATERIALS:

A. All hardware shall be of the best quality in construction, design and finish, and free from any defects. Any defective pieces shall be replaced by the Contractor at his own expense.

B. Hardware shall be of the manufacture, type, weight, function and quality as shown by factory number.

C. HINGES: Regular bearing and ball bearing types as indicated.

D. FINISH: All hardware items shall be furnished in the finish as indicated in the Hardware Groups. Contractor will replace at his own expense all items which have defects or blemishes.

E. HARDWARE SCHEDULE:

(1) Furnish the following hardware groups as indicated below or required for a complete and proper installation. Approved equals to provided manufacturers are acceptable.

MANUFACTURER LIST		
Category	Vendor Name	MFG
HINGE	H.B. IVES	IVE
ASTRAGAL	PEMKO	PEM
PANIC HARDWARE	VON DUPRIN	VON
SFIC RIM HOUSING	SCHLAGE	SCH
SFIC CYLINDER	CYBERLOCK	CL
SURFACE CLOSER	LCN CLOSERS	LCN
FLOOR STOP	H.B. IVES	IVE
SEALS	PEMKO	PEM
DOOR SWEEP	PEMKO	PEM
THRESHOLD	PEMKO	PEM

HW GROUP – 001.1
DOOR 01

Qty	Description	Catalog Number	Finish	Mfr
3 EA	HW HINGE	5BB1HW 4.5 X 4.5 NRP	630	PEM
1 EA	PANIC HARDWARE	98-L-06	630AM	VON
1 EA	SFIC RIM HOUSING	80-129	626	SCH
1 EA	SFIC CYLINDER	CL-SF03	626	CL
1 EA	SURFACE CLOSER	1461 SCUSH SRI	689	LCN
1 SET	SEALS	S88D	DKB	PEM
1 EA	DOOR SWEEP	3452AV	AL	PEM
1 EA	THRESHOLD	271A	AL	PEF

F. FASTENINGS:

- (1) Furnish necessary screws, bolts, and other fastenings for proper application of hardware. Fastenings shall be of suitable size and type of securing hardware for heavy use. Fastenings must harmonize with the hardware as to material and finish.
- (2) Furnish necessary expansion shields, toggle bolts, machine or wood screws or other suitable approved anchoring devices where hardware is to be installed on concrete, masonry or other type of backing.

6.4.07 TEMPLATES: Templates as may be required to be furnished the Contractor within seven days after receipt of an order and approved hardware schedule.

6.4.08 TOOLS AND INSTRUCTIONS: All tools and maintenance or installation instruction packed with the closers and locksets shall be given to the DOW when the project is complete.

6.4.09 INSTALLATION:

- A. As specified in Section 303.24 Finish Hardware of the Water System Standards.
- B. Hardware Supplier's Inspection: Before final inspection of the work under this contract and acceptance of the project by the DOW, the supplier of hardware and other items specified in this Section shall visit the site and carefully inspect all parts for conformance to this specification, adequacy for intended use, proper functioning, appearance, finish and successful operation, assuming joint responsibility with the General Contractor.

6.4.10 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-6.5 – SEALANTS

- 6.5.01 DESCRIPTION: The work covered under this section shall include the furnishing of all labor, materials, tools and equipment necessary for completing this item of work as specified in DIVISION 300 - CONSTRUCTION, SECTION 303.21 CAULKING of the Water System Standards, dated 2002 and as modified or supplemented hereinafter.
- 6.5.02 MATERIALS: Polysulfide caulking and miscellaneous materials as specified in DIVISION 300 - CONSTRUCTION, SECTION 303.21 CAULKING of the Water System Standards.
- 6.5.03 INSTALLATION: As specified in DIVISION 300 - CONSTRUCTION, SECTION 303.21 CAULKING of the Water System Standards.
- 6.5.04 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-6.6 - FLUID APPLIED ELASTOMERIC ROOFING

6.6.01 GENERAL CONDITIONS:

- A. **SECTION INCLUDES:** Fluid applied flexible acrylic or silicone waterproofing system over concrete. This work shall include the preparation of the roof deck, application of the roof system, and clean up.
- B. **DESCRIPTION OF FLUID APPLIED ROOFING SYSTEM:** The fluid applied roofing system must consist of a reinforced elastomeric system specifically designed for use on a roof. The system must have been approved by FMRC (Factory Mutual Research Corporation) according to Standard 4470 for Class 1 Roof Constructions which includes-Spread of Flame Fire, Windstorm Pressure, Windstorm Pull, Hail Damage, Resistance to Foot Traffic, and Susceptibility to Leakage Classifications.
- C. **SUBSTRATE APPROVAL:** All warranted jobs over any substrate must have substrate approval prior to job start up. Manufacturer may require an approved recovery board with roof breathers over certain concrete type decks. Please consult your local Technical Representative for assistance and approval.
- D. **RELATED WORK:** The Contractor shall review all sections of these specifications to determine items of work that will interface with the application of this roofing system. Coordination and execution of related sections shall be the responsibility of the Contractor.
- E. **REFERENCES:** SP-6 specification sections contain references to the following documents. They are a part of these Sections as specified and modified. In case of conflict between the requirements of these Sections and those of the listed documents, the requirements of these Sections shall prevail.

Reference	Title
ASTM B117	Test Method of Salt Spray (Fog) Testing
ASTM G-29	Test Methods for Algae Resistance
ASTM E-108	Test Method for Fire Test of Roof Coverings.
ASTM D-1653	Water Vapor Transmission of Materials
ASTM G26	Practice for Operating Light-and Water-Exposure-Apparatus (Xenon Arc Type) for Exposure of Nonmetallic Materials.
ASTM D-412	Ultimate Tensile Strength at Break
ASTM D-6083	Standard Specification for Liquid Applied Acrylic Coatings used in roofing.
ASTM C1549	Standard test method for determination of solar reflectance near ambient temperature using a portable solar reflectometer.
ASTM C1371	Standard test method for determination of emittance of materials near roof temperature using portable emissometers

Reference	Title
FM 4470	Standard for Class 1 Spread of Flame Fire, Windstorm Pressure, Windstorm Pull, Hail Damage, Resistance to Foot Traffic, and Susceptibility to Leakage Classification.

F. SUBMITTALS:

- (1) Product Data: Provide manufacturer's technical literature on products that make up the roofing system. This shall include, but is not limited to, coatings, reinforcing fabrics, fasteners, etc.
- (2) Manufacturer's Installation Instructions: Submit all data sheets available from the manufacturer on the installation of the roofing system applicable to the work.
- (3) Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

G. QUALIFICATIONS: Applicator Qualifications - The applicator of the roofing material specified herein shall be Manufacturer approved applicator. Proof of this qualification shall be provided in written form from the manufacturer of the roofing system.

H. QUALITY CONTROL:

- (1) Codes and Standards: The contractor shall make him/herself thoroughly familiar with all codes, regulations, and standards governing the specified work. Any contradiction between the manufacturer's requirements and these specifications shall be brought to the attention of the manufacturer and the specifier.
- (2) Deviations: There shall not be any deviations from these specifications unless the deviation is submitted in writing to the specifier. The request for deviation must have a letter from the roofing manufacturer's technical department approving the details of the deviation.

I. DELIVERY, STORAGE, AND HANDLING: Deliver materials to site in manufacturer's unopened and undamaged containers bearing the following information:

- (1) Name of manufacturer.
- (2) Name of contents and products code.
- (3) Net volume of contents.
- (4) Lot or batch number.
- (5) VOC content
- (6) Storage temperature limits.
- (7) Shelf life expiration date.

(8) Mixing instructions and proportions of contents.

(9) Safety information and instructions - Store and protect materials from damage and weather in accordance with manufacturer's instructions. Keep out of direct sunlight.

J. WARRANTY: Provide ten-year manufacturer's Product Warranty or a ten-year manufacturer's Labor & Material warranty.

6.6.02 PRODUCTS:

A. MANUFACTURERS:

(1) APO

(2) Hawaiian Sunguard

(3) Hydro-Stop

(4) RoofMate

(5) White Lava

(6) GacoSil Silicone

(7) Hawaiian Sunguard Silicone

(8) Gaco Roof

(9) Tropical Silicone

(10) United Coatings UniSil

(11) Approved Equal

B. MEMBRANE COMPOUND MATERIAL:

(1) Waterproofing Material: Premium Coat three stage, fabric reinforced, flexible acrylic coating, fluid applied in successive stages to form one continuous, seamless, watertight membrane; 40 mil (.04 inches / 1.016 millimeters) minimum cured total system thickness; comprised of the following:

a. Foundation and Saturation Coats: Base Coat (highly flexible water based 100% pure acrylic polymer resin coatings).

b. Fabric: Polyester, non-woven, stitch-bonded, and heat-set fabric.

c. Finish Coat: Finish Coat (ultraviolet light resistant, blend of highly flexible water based 100% pure acrylic polymer resin coating); color as selected from manufacturer's standard colors. White or highly reflective shades will not be accepted.

- (2) Reinforcing Fabric: This material shall be non-woven 100% polyester, stitch bonded, and heat set fabric with the following characteristics:

Weight: 3 oz/per square yard (106.31 grams/square meter)

Tensile Strength Warp: 74 lbs. per ASTM D 5034, Fill 45 lbs.

Elongation @ Break Warp: 21.3% per ASTM D 5034, Fill 51.3%

Ball Burst: 111 lbs. per ASTM D 3787

Trapezoid Warp: 13.5 lbs. per ASTM D 117, Fill 24.2 lbs.

Thickness: 0.018 inches per ASTM D-1777

- (3) Cured Membrane Characteristics:

PROPERTY	TEST	RESULT
Elongation:	ASTM D638	>300% elastomeric
Tensile Strength(cured):	ASTM D412	>2000 PSI (13,789kPA)
Density:		12.1 lb/gal
Volume Solids:		> or = 53 %
Weight Solids:		> or = 66%
Algae Resistance	ASTM G29	No Growth
Supported Moisture Vapor:	ASTM E96	3 Perms
Weathering:	ASTM G26	No effect after 3,000 hours
Salt Spray Test:	ASTM B117	No effect
Fire Rating:	ASTM E108	Class A
VOC (calculated):		< 72 g/L
Susceptibility to Leakage:	FM 4470	No signs of water leakage
Windstorm Pressure:	FM 4470	Meets Class 1-90
Windstorm Pull:	FM 4470	Class 1-225 on
“	“	Polyisocyanurate Class 1-270 on Expanded
“	“	Polystyrene Class 1-375 on Lightweight Concrete
“	“	Class 1-735 on Structural Concrete
Severe Hail Test:	FM 4470	No separation or rupture 1-SH
Resistance to Foot Traffic:	FM 4470	No sign of tearing or cracking
Liquid Applied Acrylic:	ASTM D6083	Approved
Solar Reflectance:	ASTM C1549	> or = 0.79
Thermal Emittance:	ASTM C1371	> or = 0.90

PROPERTY	TEST	RESULT
OTC (Ozone Transport Commission)		Compliant
CRRC (Cool Roof Rating Council)		Approved
Energy Star (Dept. of Energy) (White or Cotton Finish Coat Only)		Approved

C. ACCESSORIES:

- (1) Manufacturer's Cleaning agent for the proper cleaning of existing surfaces and coatings. Promotes adhesion of primers and coatings and has specific functional ingredients for degreasing removing soils and biological residues.
- (2) Surface Primer: Hydro-Stop Barrier Guard cementitious waterproofing sealer for concrete.
- (3) Cant Strips: Recommended composition materials are EPS (Expanded Polystyrene), Barrier Guard® & Hydro Fiber Mix, and wood (Non-Pressure Treated). Cant strips are to be installed at all internal corners, around curbs, and at all 90-degree angles specified by Hydro-Stop.
- (4) Moisture Breathers: Install moisture breathers as recommended by Hydro-Stop Technical Personnel.
- (5) Hydro-Fiber: Bulking material used in conjunction with Foundation Coat or Barrier Guard slurry (as specified by Hydro-Stop Technical Representative) to fill cracks, voids, or low depressions on various substrates.
- (6) Stable Rust Primer: water based surfactant-free primer used in direct metal applications to stabilize and protect metal surfaces.
- (7) pH Blocking Primer: Sure bond Primer as manufactured by Hydro-Stop used for blocking pH migration on concrete and lightweight concrete decks.
- (8) Traffic Topping: Hydro-Stop Traffic Coat acrylic based coating designed for light traffic areas.
- (9) Surface Sealer: ACRYSHEEN is a water-based epoxy, penetrating sealer designed to produce a clear, semi-gloss surface sheen and provide dirt resistance and weather protection.

6.6.03 INSTALLATION:

A. EXAMINATION:

- (1) Verify substrate surfaces are durable, free of dampness, loose particles, cracks, pits, projections, or foreign matter detrimental to adhesion or application of waterproofing system.

- (2) Verify that substrate surfaces are smooth and not detrimental to full contact bond of waterproofing materials.
- (3) Verify items that penetrate surfaces to receive waterproofing are securely installed.
- (4) Verify that substrate areas are adequately supported and firmly fastened in place.
- (5) Verify that the concrete deck has a minimum slope of .25 inch/foot (2.083 cm/meter)
- (6) Verify that roof does not have ponding water areas.
- (7) Verify that all attached vertical walls are properly waterproofed.

B. PREPARATION:

- (1) Protect adjacent surfaces not designated to receive waterproofing.
- (2) As a minimum, clean and prepare surfaces to receive waterproofing by removing all loose and flaking particles, grease and laitance with the use of a stiff bristle push broom and or washing with cleaner as per manufacturer's instructions. Care should be taken not to inject water into the substrate during washing. In some cases, additional drying time may be required after the cleaning process. Please consult your Manufacturer's Representative for additional advice on cleaning various roofing substrates. Make all necessary repairs to existing substrate.
- (3) Seal cracks and joints with sealant materials using depth to width ratio as recommended by sealant manufacturer.
- (4) Coordinate work with that of other trades to ensure that components, which are to be incorporated into waterproofing system, are available, do not cause deviations from these specifications requiring approval and prevent delays or interruptions as the work progresses. Verify existing conditions in advance.
- (5) Install cant strips at internal corners and metal drip edge on outside perimeter as needed.

C. APPLICATION:

- (1) Surface primer-mix slurry in accordance with manufacturer's instructions and apply two coats over masonry surface at a minimum coverage rate of 150 ft²/ gal (3.57 m²/liter). Allow to dry between coats.
 - a. Apply a single coat of primer to entire substrate at a coverage rate of 200 ft²/gal.
 - b. Base Coat & Fabric Components-Consist of one coat of base coat applied to the substrate, reinforcing fabric (sizes vary) laid into the wet base coat, and finally a second coat of base coat saturating the fabric from above. Care should be given to ensure that adjacent runs of fabric are overlapped a minimum of 4 inches (10.16 cm). Base coats are applied at a total rate of 25-40 ft²/gal (.594-.951 m²/liter) depending on substrate. Base coat should only be applied with the use of

manufacturer approved roof brushes. Rolling and spraying of the base coat are absolutely forbidden. Fabric to be cut by scissors only, all terminations are to be clean cut, straight and level.

- (2) Roof Perimeter-Using 12-inch (30.48 centimeters) fabric and the base components (described above), waterproof entire roof perimeter. Continue waterproofing up vertical surfaces and onto deck a minimum of 6 inches (15.24 centimeters) in each direction.
- (3) Roof Penetrations-Using 12-inch (30.48 centimeters) fabric and the base components (described above) seal items projecting through waterproofing material watertight. Waterproof up penetrations a minimum of 6 inches (15.24 centimeters).
- (4) Roof Field-Using 40-inch (1.016 m) fabric and the base components (as described above) seal the entire roof field. Overlap adjacent runs of fabric 4 inches (10.16 cm) minimum.
- (5) Finish Coat Component-Apply 2 coats of finish coat at a combined total rate of 70 ft²/gal (1.664 m²/liter) over entire roof area. Minimum milage requirements are 11.5 mils (.0115 inches / .292 millimeters) wet and 6.1 mils (.0061 inches / .155 millimeters) dry per coat. Allow to dry between coats. Total finish coat dry thickness should be a minimum of 12.2 mils (.0122 inches / .31 millimeters).
- (6) Completed Finish Coat System-System must be installed to a minimum 40 mil (.04 inches / 1.016 millimeters) total cured thickness.

- D. PROTECTION OF FINISHED WORK: Use cleaner as per manufacturer instructions to clean roofing system when needed. Please consult your manufacturer Technical Sales Representative for recommendations for maintaining the roofing system. Monitor finished system for 7 days, sweeping off birdbaths to allow for full cure.
- E. CLEANING: Immediately clean unscheduled surfaces receiving waterproofing in accordance with manufacturer's instructions.
- F. MAINTENANCE: Use cleaner per manufacturer instructions to clean coating system when needed. Please consult your manufacturer for recommendations for maintaining the roofing system.

6.6.04 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-6.7 – PAINTING

6.7.01 DESCRIPTION:

- A. This item of work shall include the furnishing of all labor, materials, tools, and equipment necessary for completing exterior and interior painting including all piping above the floor line and as specified in DIVISION 300 - CONSTRUCTION, SECTION 303.27 PAINTING of the Water System Standards, dated 2002, as amended hereinafter, and as applicable to this project. Items to be painted shall include all new work and all existing work as indicated.
- B. Items to be painted shall include, but not necessarily be limited to the following:
- (1) Interior surfaces of the control building walls, soffits
 - (2) Interior door and frame.
 - (3) Exterior door and frame.
 - (4) Metal louver.
 - (5) Metal angle frames.
 - (6) Metal screen.
 - (7) Junction boxes and miscellaneous metal surfaces.
 - (8) Copper piping (indoors).
 - (9) Deepwell pump motor and discharge base (outdoors)
 - (10) Deepwell discharge pipe, fittings, valves, and vent (outdoors)
 - (11) Existing outdoor piping, fittings, valves, and appurtenances

6.7.02 SUBMITTALS:

Submit one (1) hard copy and electronic set of the following to the DOW representative for approval. No ordering of materials shall be done prior to approval.

- A. **CERTIFICATIONS:** Asbestos-free, lead-free, zinc chromate-free, strontium-chromate-free, cadmium free, and mercury free, cadmium free paint certificates shall be submitted to the DOW representative.
- B. **MANUFACTURER'S PRODUCT DATA SHEETS:** Manufacturer's Product Data Sheets for the primers, paints, coatings, solvents, sealing and patching materials, sealants and caulking, and other materials being used shall be submitted. Data sheets shall indicate thinning and mixing instructions, required film thickness (mil) and application instructions.

- C. MANUFACTURER'S MATERIAL SAFETY DATA SHEETS: Manufacturer's Material Safety Data Sheets for coatings, solvents, and other hazardous materials shall be submitted to the DOW representative.
- D. PAINT SCHEDULE: Submit painting schedule of paint application for all surfaces as per Section SP-6.7.08, for approval by the DOW prior to application.

6.7.03 SPECIAL REQUIREMENTS

- A. CODES: The Contractor shall comply with the State OSHL (Occupational Safety and Health Law) and all pollution control regulations of the State Department of Health.
- B. PROTECTION:
 - (1) Persons:
 - a. The Contractor shall take all necessary precautions to protect public pedestrians and DOW employees.
 - b. The Contractor shall provide, erect and maintain safety barricades around scaffolds, hoists and wherever Contractor's operations create hazardous conditions in order to properly protect the public and tenants.
 - (2) Completed Work: The Contractor shall provide all necessary protection for wet paint surfaces.
 - (3) Protective Covering: The Contractor shall provide and install protective covering over equipment, floor and other areas that are not scheduled for treatment. Protective covering shall be clean sanitary drop cloth or plastic sheets. Paint applied to surfaces not scheduled for treatment shall be completely removed and surfaces shall be returned to original condition.
 - (4) Safeguarding of Property: The Contractor shall take whatever steps may be necessary to safeguard his work and also the property of the DOW during the execution of this Contract. He shall be responsible for and make good on any and all damages and for losses to work or property caused by his or his employee's negligence.
 - (5) Fire Safety: The Contractor shall direct his employees not to smoke in the vicinity and exercise precautions against fire at all times. Waste rags, plastic (polyester sheets), empty cans, etc. shall be removed from the site at the end of each day.
- C. STORAGE AREA FOR MATERIALS: No paint material, empty cans and paint brushes and rollers may be stored in buildings, but shall be stored in separate storage facilities away from the buildings.

6.7.04 MATERIALS

- A. LEAD PROHIBITION: All paint shall be lead-free.
- B. MERCURY PROHIBITION: All paint shall be mercury-free.

- C. CHROMATE PROHIBITION: All paint shall be free of zinc-chromate and/or strontium-chromate.
- D. CADMIUM PROHIBITION: All paint shall be cadmium-free.
- E. All materials shall be delivered to the job site in undamaged original containers bearing the manufacturer's label and shall be stored in such a manner as to prevent damage. All rejected materials shall be removed from the job site immediately.
- F. Thinning of paint shall be done using material recommended by the manufacturer. Mix proprietary products according to manufacturer's printed specifications. Compound thinner, mineral oil, kerosene, refined linseed oil, or gasoline shall not be used for thinning.
- G. Except for metal primers, all paint shall contain maximum amount of mildewcide per gallon of paint permitted by the mildewcide manufacturer without adversely affecting the quality of the paint.
- H. The supplier shall submit a signed certificate indicating the amounts of mildewcide added by both the paint manufacturer and the paint supplier. Mercurial fungicide shall not be used.

6.7.05 SURFACE PREPARATION

- A. MILDEW REMOVAL: Remove all mildew and sterilize the surface to be coated using one of the following methods:

Apply a treatment solution composed of the following ingredients and in the noted proportions to the affected surface using a sponge or low-pressure sprayer:

2/3 cup TSP (Trisodium Phosphate)
 1 quart household bleach
 3 quarts warm water

Note: Household bleach shall not be mixed with ammonia or any detergents or cleaners containing ammonia as this will create a poisonous gas.

Scrub the surface as necessary to completely remove the mildew.

or,

Apply a commercial mildew treatment solution such as Purex, Jomax Remover or equal in strict accordance with the manufacturer's recommendations and instructions.

Following treatment, the surface shall be cleaned with potable water and allowed to thoroughly dry before coating work.

- B. FERROUS METAL AND GALVANIZED METAL TO BE REPAINTED:

(1) Remove from surface to be repainted all foreign matter such as tape, gum.

- (2) Remove all rust to bare metal. Remove all loose, blistered, scaled, crazed, chalky finish to an existing tight and firm finish.
- (3) Where existing finish remains clean, tight and firm, prepare surface with liquid sandpaper.
- (4) Immediately, spot prime, with specified primer, areas where bare metal is exposed.
- (5) Completely wipe or wash all surfaces with mineral spirits or other appropriate solution as required to remove any accumulated film of wax, oil, grease, smoke, dust, dirt, chalky or other foreign matter which would impair bond of, or bleed through new finish.

C. CONCRETE TO BE REPAINTED:

- (1) Remove from surfaces to be repainted all foreign matter such as nails, screws, staples, tape and gum.
- (2) Remove all loose, blistered, scaled, crazed or chalky finish to an existing tight and firm finish.
- (3) Where the existing finish remains tight and firm, prepare the surface by lightly sanding. Where the paint has been removed, sand the edges of scarred areas to a smooth feathered edge.
- (4) Wash all surfaces with a solution of T.S.P. (trisodium-phosphate) and water or other appropriate solution to remove any accumulated film of wax, oil, grease, smoke, dust, dirt, chalking or other foreign matter which would impair the bond of, or bleed through the new paint finish. After washing, rinse the surface with potable water and allow to thoroughly dry.
- (5) Fill holes, cracks, open joints and other imperfections with appropriate compound and allow to set.
- (6) Spot prime areas where bare concrete or fill material is exposed with the specified primer and feather out onto adjacent paint.

6.7.06 PAIN T APPLICATION:

A. GENERAL:

- (1) All work shall be done in a workmanlike manner by skilled and experienced mechanics and shall conform to the best painting practices.
- (2) All materials shall be applied in accordance with the manufacturer's specifications and the finished surfaces shall be free from runs, sags, drops, ridges, waves, laps, streaks, brush marks and variations in color, texture and finish (glossy or dull). The coverage shall be complete and each coat shall be so applied as to produce a film of uniform thickness. No paint, varnish or enamel shall be applied until the preceding coat is thoroughly dry and approved.

(3) No exterior painting of unprotected surfaces shall be done in rainy, damp weather. Coats shall be applied only to surfaces that are thoroughly dry.

- B. APPLICATION: Shall be by brush or roller only.
- C. Application of a coat of paint shall constitute the Painting Contractor's acceptance of the surface and the responsibility for it.

6.7.07 MISCELLANEOUS:

- A. INSTALLATION OF REMOVED ITEMS: After completion of final paint coat, removed items shall be reinstalled.
- B. CLEAN-UP:
 - (1) During the progress of the work, all debris, empty crates, waste, drippings, etc. shall be removed by the Contractor and the grounds about the areas to be painted shall be left clean and orderly at the end of each work day.
 - (2) Upon completion of the work, staging, scaffolding, containers and all other debris shall be removed from the site. All paint splashed or spilled upon adjacent surfaces not requiring treatment (hardware, fixture, floors) shall be removed and the entire job left clean and acceptable.

6.7.08 PAINT SCHEDULE: In addition to the schedule listed in DIVISION 300 - CONSTRUCTION, SECTION 303.27 PAINTING the following schedule supplements surfaces.

- A. Any existing painted surfaces not specifically noted in the finish schedule shall be finished to match adjoining work.
- B. Paint schedule is based on the products of manufacturers approved by the DOW. Provide all other paints required for all other surfaces as approved by the DOW.
- C. The painting schedule shall apply to previously painted surfaces.
- D. At the option of the DOW representative, paint sheens may be revised at no additional cost to the DOW.
- E. Obtain approval of all paint schedule from the DOW representative prior to ordering any paint.
- F. PAINT SCHEDULE FOR EXISTING SURFACES:
 - (1) See Water System Standard, DIVISION 300 - CONSTRUCTION, SECTION 303.27 PAINTING and DIVISION 400 - APPROVED MATERIAL LIST AND STANDARD DETAILS, SECTION 402 APPROVED MATERIAL LIST, V PAINTS AND COATINGS, or as directed by DOW.

- (2) For repainting of existing painted surfaces, provide finish paint as per Paint Schedule, over one coat primer as recommended by the paint manufacturer.

G. PAIN T SCHEDULE FOR NEW SURFACES: See Water System Standard, DIVISION 300 - CONSTRUCTION, SECTION 303.27 PAINTING and DIVISION 400 - APPROVED MATERIAL LIST AND STANDARD DETAILS, SECTION 402 APPROVED MATERIAL LIST, V PAINTS AND COATINGS, or as directed by DOW.

6.7.09 COMPATIBILITY OF PAINTING SYSTEMS AND SUBSTRATES

A. The Contractor shall ensure that painting systems specified are compatible with existing painted surfaces. Alkyd paints shall not be applied over existing latex coating. Alkyd paints shall not be used over cementitious surfaces. Latex paints shall not be applied directly over alkyd paints without proper surface conditioner and approval by the DOW.

B. FIELD TEST FOR ALKYD OF LATEX PAINTS: The Contractor shall perform the following field tests for compatibility of substrates to new painting systems:

- (1) Latex films will dissolve when wiped with rubbing alcohol; alkyd films will not.
- (2) When sanded, latex films will “clog” sandpaper; alkyd films will sand clean.
- (3) Alkyds will soften after applying a 10 percent solution of Drano in water; latex films will not soften.
- (4) Alkyds will burn when exposed to a flame; latex film will not burn.
- (5) Paints which do not respond to two or more of the above tests are probably epoxy, urethane, or other type of coating.
- (6) Provide a packaged swab test in accordance with the package directions.

6.7.10 SURFACES NOT REQUIRING PAINTING: Copper and stainless steel unless otherwise directed by DOW.

6.7.11 COLOR SCHEDULES: The colors to be used shall be as selected by the DOW. The Contractor shall be responsible for the uniformity in color of all painted areas. All non-uniform areas shall be repainted to match and shall be paid for by the Contractor.

6.7.12 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-7 MECHANICAL WORK

TABLE OF CONTENTS FOR SECTION SP-7

<u>SECTION</u>	<u>DESCRIPTION</u>
7.1	PIPING AND FITTINGS
7.2	VERTICAL TURBINE PUMP

SECTION SP-7.1 - PIPING AND FITTINGS

7.1.01 INTENT OF SPECIFICATIONS AND DRAWINGS:

- A. Specifications and Drawings are prepared in abbreviated form and include incomplete sentences. Omitted words and phrases shall be provided by inference to form complete sentences.
- B. Specifications and Drawings complement each other and what is specified, scheduled, or mentioned by one shall be binding as if called for by both. Specifications and Drawings are intended to specify nature, quantity, and quality of work.
- C. Before bidding, Contractor shall visit project site and carefully review Specifications and Drawings and obtain from local authority having jurisdiction their requirements. Any error or omissions shall be reported to the DOW per the RFP before submission of bids for interpretation or clarification.
- D. The mechanical drawings included in this project are functional in nature and do not specify exact locations of equipment or equipment terminations.

7.1.02 DEFINITIONS:

- A. "Provide" means "furnish and install".
- B. "Approved equal" means qualify material according to paragraph, "Materials and Workmanship".
- C. "DOW" means the "Department of Water".
- D. An "arrangement, layout, or outline drawing" is one which shows the physical space, weight, and mounting requirements of a mechanical feature.
- E. "Structures" refer to the structural elements of a building that resist gravity, seismic, wind, and other types of loads. Structural components include columns, posts, beams, girders, joists, bracing, floor or roof sheathing, slabs or decking, load-bearing walls, and foundations.
- F. "Nonstructural Components" refer to the nonstructural portions of a building include every part of the building and all its contents, except the structural portions, that carry gravity loads and that may also be required to resist the effects of wind, snow, impact, temperature and seismic loads. Nonstructural components include, but are not limited to, ceilings, partitions, windows, equipment, piping, ductwork, furnishings, lights, etc.
- G. "Non-building Structures" refer to all self-supporting structures that carry gravity loads and that may also be required to resist the effects of wind, snow, impact, temperature and seismic loads. Non-building structures include, but are not limited to, pipe racks, storage racks, stacks, tanks, vessels and structural towers that support tanks and vessels.
- H. **MAXIMUM PRESSURE:** The greatest continual pressure at which the piping system is designed to operate.

- I. TEST PRESSURE: The hydrostatic, air, or gas pressure used to determine system compliance.
- J. TAKE DOWN COUPLING: Pipe couplings that facilitate disassembly of piping systems without damage or demolition of piping system components.
- K. EXPOSED: All area exposures other than buried, submerged, or encased/embedded.
- L. CORROSIVE PROCESS AREA: Areas where the atmosphere contains enough corrosive substances to necessitate the use of non-corrosive materials. All incidental materials used in a corrosive process area shall be of 316 stainless steel for plate and 304 stainless steel for fasteners unless noted otherwise.

7.1.03 REFERENCES:

- A. SP-7.1 specification sections contain references to the following documents. They are a part of these Sections as specified and modified. In case of conflict between the requirements of these Sections and those of the listed documents, the requirements of these Sections shall prevail.

Reference	Title
ANSI B31.3	Process Piping
ASME B1.1	Unified Inch Screw Threads
ASME Section IX	Boiler and Pressure Vessel Code; Welding and Brazing Requirements

7.1.04 MATERIALS AND WORKMANSHIP:

- A. Materials and equipment shall be new and free from defects and shall be listed for the purpose for which they are to be used by an independent testing laboratory. Three such organizations are Underwriters Laboratories (UL), American National Standards Institute (ANSI), and American Society of Mechanical Engineers (ASME). Those items listed by Underwriters' Laboratories shall bear the "UL" label of approval. Independent testing laboratory shall be acceptable to the inspection authority having jurisdiction.
- B. Brand names, manufacturer's names, and catalog numbers indicate standard of design and quality required. Substitute materials may be used if qualified by written permission from the DOW. List of substitute material together with qualifying data shall be submitted per the RFP.
- C. Qualifying data shall include catalog cuts, shop drawings, and/or specifications to show equality with materials specified herewith.
- D. Comply with local ordinances and regulations of the County of Kaua'i. Workmanship subject to approval of the DOW who shall be afforded every opportunity to determine skill and competency. Concealed work may be reopened at random during formal inspection by the DOW.

- E. Comply with Hawai'i Revised Statutes HRS§103-50, Americans with Disabilities Act Accessibility Guidelines (ADAAG) and Disability and Communication Access Board (DCAB) Interpretive Opinion 2000-05.
- F. Refer to Section SP-7.1.21 for Piping System Schedule.

7.1.05 SUBMITTALS

- A. Submittals to conform to Section SP-1.6, SP-1.17, and the Water Construction Notes.
- B. For each piping system (refer to Piping System Schedules in Section SP-7.1.21), submit document listing pipe, fittings, linings, coatings, valves, flexible connectors, expansion joints, couplings, bolts, gaskets, restraints, and other items provided for each applicable pipe size and category.
- C. WELDING: Prior to commencing any welding of stainless steel pipe, supports, and/or structural attachments, provide a written description of welding techniques, including, but not limited to, materials, methods, and quality control. Identify differences in shop and field techniques. Indicate in the submittal that the welding technique has been reviewed for each piping service and certify that the technique is acceptable for the intended service condition.

7.1.06 DEPARTURES FROM DRAWINGS AND SPECIFICATIONS

- A. Departures resulting from substitution of materials or system shall be accompanied by appropriate changes in all affected work of every trade. Such changes shall be at no increase in the contract amount and shall be the responsibility of the subcontractor or supplier responsible for the departures. Changes proposed by the Contractor shall be based on a system approach and shall be allowed if implemented without decrease in quality in performance or operations, increase in utility space to install the equipment. Such departures shall be submitted and noted in shop drawings for approval by the DOW. Departures initiated by other trades, requiring changes in the electrical system as well as other systems, shall be accompanied by appropriate changes to all affected work of every trade, at no increase in contract amount, by the trade responsible for the departures.
- B. The General Contractor shall be responsible to coordinate, approve, and select systems that do not impose unaccounted for impact on the mechanical work. It shall be understood that after the award of contract, all departures having impact, unless otherwise noted, have been coordinated so that all appropriate changes to the mechanical system required to accommodate the departures shall be at no additional cost to the DOW.

7.1.07 PROJECT/SITE CONDITIONS

- A. SITE CONDITIONS: There is one project location. It is an existing facility that cannot be shut down for any appreciable period. The Contractor shall plan work on existing equipment and facilities to limit service interruptions to the lowest practical time period. The project location is:

(1) Kīlauea Wells No. 1 and No. 2

Contractor shall verify the location of existing equipment, piping, and appurtenances. Contractor shall not disturb and shall maintain in service all existing piping, appurtenances, electrical conduits, and wiring unless otherwise specified. Locations are approximate. See electrical and civil drawings for locations of piping, electrical conduit, and equipment.

The entire outdoor area shall be designated as a CORROSIVE, PROCESS AREA.

7.1.08 DELIVERY, STORAGE, AND HANDLING OF MATERIALS

- A. Deliver pipe, fittings, and specials to site using loading methods which do not damage any of the materials.
- B. Piping materials delivered to site will be clearly marked to indicate size, type, and class/schedule.
- C. Until ready for incorporation in the work, store on site as recommended by the piping materials manufacturer to prevent damage, undue stresses, or weathering.
- D. Store materials at least 8 inches above ground. Provide sufficient supports to prevent undue bending.
- E. Cover openings in piping, and temporarily seal to protect from contamination.
- F. Protect materials and equipment from damage due to environmental conditions. Use protective cover, and protect from surface water by elevating above floor or surrounding grade.
- G. Protect unfinished work at end of each workday from damage, contamination and moisture by use of plugs, caps or covers.
- H. Protect piping and valves from damage pending performance of system tests.
- I. Use proper implements, tools, and facilities for the proper protection of the pipe. Exercise care in the installation so as to avoid damage to pipe.
- J. Inspect each pipe and fitting prior to installation. Do not install damaged pipe.
- K. Prevent entry of foreign matter during handling, assembling, and installation. Use compressed air, wire brush, solvent and other acceptable means to remove all foreign matter from inside of pipe prior to installation. Remove residual scale, dirt and other foreign matter from interior of piping before final connections are made.

7.1.09 PIPE MATERIALS – GENERAL

- A. All pipe materials to be new, free from defects and conforming to the requirements and standards identified in the Piping System Schedules (Section SP-7.1.21).
- B. Provide long radius (greater than or equal to 1.5 x nominal diameter) elbows unless otherwise specified on the drawings.

7.1.10 STRUCTURAL ELEMENT PENETRATIONS

- A. Penetrations through structural elements are referenced to a custom detail or Standard Detail. Where a penetration detail is not specified, conform to the Standard Detail relevant to the type of structure, exposure, and type of pipe.
- B. Provide pipe sleeves capable of supporting the loads applied during placement of concrete or during block work erection.

7.1.11 PREPARATION FOR INSTALLATION

- A. Prior to installation, inspect, and field measure to ensure that previous work is not prejudicial to the proper installation of piping.
- B. The Drawings are, in part, diagrammatic, make all minor modifications to suit installed equipment and structural element locations and elevations and coordinate with electrical construction.
- C. Piping arrangements indicated on the drawings have been estimated from the approximate configuration of the type of equipment listed in the equipment specifications. If the equipment to be provided does not have the same configuration, modify the piping arrangement as necessary. Include any piping modifications in shop drawings submitted prior to fabrication or installation.

7.1.12 JOINT AND COUPLING OPTIONS

- A. Provide pipe connection (joint and coupling) options as specified in the Piping System Schedule.
- B. Where connections other than those indicated on the Piping System Schedule are specified on the Drawings, locate the connection specified on the drawing at the specific location indicated on the drawing.

7.1.13 SLEEVES

- A. Unless otherwise noted in the specified pipe penetration details or otherwise approved by the Construction Manager, provide sleeves where piping passes through a wall, floor, or ceiling.
- B. Locate and place sleeves prior to construction of cast-in-place elements and prior to the construction of concrete and masonry building elements.

7.1.14 EXPOSED INSTALLATION

- A. PIPING SYSTEM LAYOUT:
 - (1) Drawings show general layout of piping. Exact dimensions determined by Contractor.
 - (2) Use reducing fittings where change in pipe size occurs.

- (3) Make changes in direction only with fittings.
 - (4) Install piping with not less than minimum slope to ensure adequate drainage and venting.
 - (5) Maintain clear areas around equipment to allow adequate access for maintenance as specified in this Section.
- B. Accurately cut all piping for fabrication to field measurements.
 - C. Install pipes in straight alignment and parallel to wall. Do not exceed 3/8-inch variance over 30 feet from the true alignment in any direction.
 - D. Do not cut or weaken the building structure to facilitate installation of piping.
 - E. Insulate hot systems to protect personnel and to convey heat to the outdoors. Insulate piping systems in accordance with the Piping System Schedule (Section SP-7.1.21).
- 7.1.15 FLEXIBLE HOSE: Provide flexible hose as shown on the drawing and specified in the Piping Schedule (Section SP-7.1.21).
- 7.1.16 REPAIR/RESTORATION: Patching inserts, overlays, or pounding out of dents is not permitted.
- 7.1.17 FIELD QUALITY CONTROL
- A. The Contractor shall coordinate with DOW to mobilize their generator onsite into the Generator Shelter prior to final inspection to ensure that all exhaust piping, fittings, and components fit as intended.
 - B. Inspection of final installation by DOW shall be required at the completion of the installation.
 - C. No pressure testing shall be required for the piping on this project.
- 7.1.18 CLEANING AND FLUSHING: After installation and prior to inspection, perform initial cleaning of piping system. Clean piping greater than 6 inches and less than 24 inches by passing a tightly fitting cleaning ball or swab through the pipeline, unless specified otherwise. Give lines smaller or equal to 6 inches an initial flush or purge.
- 7.1.19 RECORD DOCUMENTS: Record documents refer to those documents maintained and annotated by the Contractor during construction, and include all Contract Drawings marked up with any RFI and submittal changes along with original submittal drawings.
- 7.1.20 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

Test Conditions

Pressure (psi)	Duration (min.)	Medium
None	None	None

Notes:

1. Pipe and fittings shall be insulated as specified with removable blanket type insulation. Flexible mineral wool blanket insulation designed for continuous 1200°F service. Sewn or stapled covers encapsulating insulation with stainless steel staples/hog rings. Close fit to the piping, pipeline appurtenance, or equipment housing. Cover fabric rated for continuous exposure to the temperature range of the insulation. Secured in place with stainless steel lacing hooks, lock washers, and lacing wire. Stitched or quilted to prevent consolidation, shifting, or settlement of insulation when subjected to vibration. Insulate stainless steel pipe located indoors. Do not insulate flexible hose or piping located outdoors.

Component	Line Size	Rating	Conn./Joints	Material	Notes
Pipe	1/2" thru 2"	Sch. 40S	THD, BW	<u>Stainless Steel</u> : ASTM A312-316L, Seamless, Dim. per ASME B36.19.	
	2 1/2" thru 8"	Sch. 10S	BW	<u>Stainless Steel</u> : ASTM A312, Type 321 or 316L seamless, welded.	
Flexible Hose	All	1200°F		Wire reinforced, Aluminum-covered fiberglass, Flexaust Flex-Lol 1050 or equal Wire reinforced, Multi-layered, treated fabric, Novaflex U-Lok 1500 or equal	
Lining for Pipe & Fittings	All	-----	-----	None	
Insulation	All		-----	See Notes	I
Fittings	1/2" thru 2"	3000# Sch. 40S	THD, BW	<u>Forged Stainless Steel</u> : ASTM A182-316L, Dim. per ANSI B16.11 <u>Wrought Stainless Steel</u> : ASTM A403- WP316L, Dim. per ANSI B16.11. <u>Cast Stainless Steel</u> : ASTM A351-CF8M, Dim. per MSS-SP-114. Elbows to be LR ELL.	
	2 1/2" thru 48"	3000# Sch. 5S	THD, BW, FLG, BW	<u>Forged Stainless Steel</u> : ASTM A182-F316L, Dim. per ANSI B16.11. <u>Wrought Stainless Steel</u> : ASTM A403-WP316L, Dim. per ANSI B16.9. <u>Cast Stainless Steel</u> : ASTM A351-CF8M, Dim. per MSS-SP-114. <u>Fabricated Stainless Steel</u> : ASTM A774-316L, Dim. per AWWA C226. *Elbows to be LR ELL or Five Cut Long Radius Miter Elbow.	
Taps	All	3000#	THD, BW	<u>Forged Stainless Steel</u> : ASTM A182-F316L, Dim. per ANSI B16.11.	
Flanges	All		FLG	See Drawings	
Weldolets / Thredolets	All	3000#	BW x THD	<u>Stainless Steel</u> : ASTM A182-F316L, Dim. per MSS-SP-97.	

Component	Line Size	Rating	Conn./Joints	Material	Notes
Flange gaskets	All	-----	-----	See Notes	2.
FLG Bolts, nuts, and hardware	All		----	None	
Valves	1/2" thru 2"	150#	THD	<u>Ball Valves: Hard graphite seated, floating ball, threaded ends. Kitz 150-U-T-DZ-3H-O or equal.</u>	

Buried and Encased

N/A

7.1.21 – PIPING SYSTEM SCHEDULE

Piping Service	Engine Exhaust					
Piping System Abbreviation	EE					

END OF SECTION

SECTION SP-7.2 – PUMPING UNITS

7.2.01 DESCRIPTION:

This Section of the specifications covers the furnishing, installing and testing of the new Pump No. 2, which will be used to replace the existing Pump No. 2. The pumping unit shall consist of an outdoor-rated, vertical solid shaft, multi-stage turbine pump with fabricated head configured for aboveground discharge. The pump will have a flanged mounting base.

Design requirements, dimensions, and characteristics of the new pumping unit is based on Gicon Pumps lineshaft turbine pumping units, Model 10RJHC (12 stage). The Contractor shall field verify dimensions on plans and specifications and submit the dimensions with the pumping unit product data, pump curves, and shop drawings for DOW approval prior to ordering the pumping unit. The Contractor shall be responsible for proper fit of the pumping unit installation. The existing piping and equipment that are disturbed during this work and refurbished components that were previously painted shall be painted to match new piping and equipment.

To comply with sanitary survey requirements, Contractor shall seal all openings to the system piping, cap or plug all open pipe nipples or fittings with threaded pipe plugs; or caps and seal all flanged openings through bolted and gaskets covers. Upon reinstallation of the pump, seal the discharge head to the pump base and turn down and screen all vacuum release fittings.

All new aboveground components of the pumping unit, including factory painted items, shall be painted as specified in Section SP-6.7. The color shall match the existing pump system. Payment for painting work shall be part of the unit price bid or lump sum bid, whichever is specified, for the item of which it is a part.

7.2.02 EXISTING PUMP AND WELL DATA:

- A. Pump Rated Capacity at 1,760 rpm: 700 gpm at 474 ft head
- B. Existing Pump Bowl Assembly: 12 Stage
- C. Motor Nameplate Rating: 125 hp, 3-phase, 60 Hz, 460 volts, 1,780 rpm
- D. Discharge Column Size: 8 inches
- E. Well Casing Inside Diameter: 12 inches
- F. Top of Pump Bowl Elevation: -20 ft±
- G. Elevation of Bottom of Casing: -120 ft±
- H. Elevation of Bottom of Well: -450 ft±
- I. Elevation of Top of Pump Slab: 390 ft±
- J. Elevation of Estimated Static Water Level: 16 ft±

7.2.03 EXISTING WELL INSPECTION:

The Contractor shall conduct an inspection of the existing well before installing the new pumping unit. The Contractor shall obtain written approval of the proposed inspection procedure from the DOW before the inspection may be conducted. The inspection shall be conducted by a Contractor holding a current C-57 Well Drilling Specialty License from the State of Hawai'i who shall inspect the existing well for silting, caving-in and foreign materials before re-installing the pumping unit. The inspection shall include a visual inspection of the well by video camera lowered into the well. The existing well inside diameter shall be recorded. A written report stating the results of the inspection along with an updated layout drawing showing all dimensions and elevations shall be submitted to the DOW. The DOW reserves the right to reject any inspection that is conducted without written prior approval and require another inspection to be conducted at no additional cost to the DOW. The Contractor shall be liable for any damages resulting from the re-installation of the pumping unit prior to DOW's approval of the inspection procedure.

7.2.04 NEW VERTICAL LINE SHAFT TURBINE PUMPING UNIT DESCRIPTION:

- A. NUMBER OF PUMPING UNITS REQUIRED: One (1)
- B. PUMP BOWL ASSEMBLY:
 - (1) Number required: One (1)
 - (2) Stages: Twelve (12)
 - (3) Pump rated capacity and head rated speed: 700 gpm at 474 feet head total dynamic head (TDH), minimum
 - (4) Minimum pump efficiency: 81.0%
 - (5) Maximum shut-off head: 618 feet
 - (6) Rated pump speed: 1,800 rpm
 - (7) Impeller Material: Type 316 Stainless Steel, ASTM A774M-00
 - (8) Impeller Diameter: 9.5 inches, maximum
 - (9) Bowl Size: 10.76 feet
 - (10) Pump Bowl Impeller Shaft Material: Type 416 stainless steel, ASTM A582M-95b
 - (11) Pump Bowl Material: Cast iron CL30 Enamel, ASTM A48-94e1
 - (12) Pump used to specify pump performance characteristics: Gicon Pumps Lineshaft Vertical Turbine Pump, Model 10RJHC (12 stage).
 - (13) Pump shall conform to SECTION SP-7.2.05.

C. PUMP MOTOR: Replacement motor shall be supplied with the following ratings and features.

- (1) Number required: One (1)
- (2) Motor Type: Vertical Turbine Enclosed
- (3) Motor Position: Vertical
- (4) Motor Enclosure: Totally Enclosed Fan Cooled (TEFC)
- (5) Motor Insulation: Class F
- (6) Motor Electrical Ratings:
 - a. Horsepower: 125 HP
 - b. Controller Type: Reduced Voltage Solid State Starter
 - c. Maximum Speed: 1,790 rpm
 - d. Voltage: 460 VAC, 3-phase, 60 Hz
 - e. Full-Load Amps: 147
 - f. NEMA Design: B
 - g. Service Factor: 1.15
 - h. Nominal Efficiency Minimum: 95%
- (7) Motor Accessories:
 - a. 115 V space heater
 - b. Winding temperature switches, one per winding/phase
- (8) Motor shall conform to SECTION SP-7.2.06

D. MOTOR DRIVE SHAFT: The existing motor drive shaft shall be replaced with new. The drive shaft shall connect the new head shaft with new motor-pump coupling. The length of the drive shaft shall be cut to fit the new motor.

- (1) Number Required: One (1)
- (2) The drive shaft shall be ground and polished Type 416 stainless steel conforming to ASTM A582M-95b. The shaft shall be furnished in a length to fit the new motor. A suitable method shall be provided on the top end of the shaft to allow for impeller adjustment by means of an adjusting nut. The nut shall be provided with a positive locking device.

E. DISCHARGE HEAD ASSEMBLY:

- (1) Head Baseplate: A new head baseplate shall be provided.
- (2) Discharge head and mechanical seal: The existing discharge head and mechanical seal shall be replaced with new.
 - a. Size of discharge flange: 8 inches
 - b. Class of pipe flange: 250 lb. ANSI B16.1
- (3) Head shaft and head shaft coupling: The existing head shaft and head shaft coupling shall be replaced with new.
- (4) The discharge head assembly shall conform to SECTION SP-7.2.05.B.

F. LINE SHAFT AND LINE SHAFT COUPLINGS:

- (1) Minimum shaft size: 1.19 inch diameter
- (2) Shaft material: 416 Stainless Steel
- (3) Coupling Material: 416 Stainless Steel

G. AIR LINE:

- (1) Bottom of air line elevation: -20 ft±
- (2) Air line size: 1/4-inch
- (3) Air line material: Brass or Type 316 stainless steel, AWWA C800. 85% copper and 5% each of tin, lead, and zinc. Conforming to NSF 61.
- (4) Contractor shall field measure new air line during installation and provide the installed length from the top of the pump baseplate to the nearest 0.5 feet.
- (5) Contractor shall connect the existing air line stub out to a new Contractor-provided tap through the new baseplate and/or discharge head in order to connect the air line from the inside of the well to the outside of the well.

H. FACTORY LABORATORY PUMP TEST REQUIREMENTS:

- (1) Minimum guaranteed efficiency of pump bowl assembly at rated capacity and head: 81.0%
- (2) Pump test shall conform to SECTION SP-7.2.12.

7.2.05 PUMPS:

The vertical turbine pump shall be of the multi-stage type as manufactured by Gicon Pumps & Equipment or approved equal.

The manufacturer of the pump bowl assembly shall be certified by the International Organization of Standards (ISO) as conforming to the requirements of the ISO 9000 series standards.

The pump bowl assembly shall be customized (impeller-trimming), assembled, and tested at the manufacturer's facility certified by the International Organization of Standards (ISO) as conforming to the requirements of the ISO 9000 series standards.

Each pumping unit shall consist of a motor, a pump bowl assembly, a discharge column assembly and a discharge head assembly.

The pumping unit shall conform to the standards set for by "NSF/ANSI Standard 61: Drinking Water System Components-Health effects", 61-2013 or most recent version.

The pumping unit supplied shall conform to these specifications and the "American National Standard for Deepwell Vertical Turbine Pumps – Line Shaft and Submersible Types", ANSI B58.1 as last revised. These specifications shall serve as a complement to ANSI B58.1 and, where contradictions occur, these specifications shall govern. These specifications indicate minimum material quality and performance required.

All components of the pumping unit shall meet the revised Reduction of Lead in Drinking Water Act. All components shall conform to the NSF 61 Annex G, certifying low lead content in line with the Safe Drinking Water Act.

A. PUMP BOWL ASSEMBLY: The pump bowl assembly shall consist of the pump bowls, impellers, impeller shaft, suction case, discharge case, and strainer.

The pump manufacturer shall provide enough clearance in the pump bowls to allow for any distortion of the pump shaft under any operating condition without the impeller making contact with the bowl.

(1) Pump Bowls: The pump bowls shall be designed for a minimum pressure of 300 psi and shall be made of close-grained cast iron, free from blow holes, sand holes, and other defects. The bowls shall conform to ASTM Designation A48, Class 30 or better, as required, with a minimum tensile strength of 30,000 pounds per square inch. The bowls shall be capable of withstanding a hydrostatic pressure equal to twice the pressure at shutoff head, whichever is greater. Each bowl shall be glass lined and accurately machined and fitted to close dimensions and fitted with bronze sleeve type bearings on each side of the impellers.

(2) Impellers: The impeller shall be of the fully-enclosed type and shall be of Type 316 stainless steel (ASTM A744M-00), or other approved material, of heavy construction and free from blow holes, porosity and other defects. Impellers shall meet the revised Reduction of Lead in Drinking Water Act. The impeller shall be finished all over, accurately fitted and perfectly balanced per ISO 1940 or ANSI 2.19 Grade 2.5. Passages shall be smooth to assure efficient operation and to prevent air or sand locking. The impeller shall be locked securely to the shaft with steel tapered collets. The impellers shall be so designed as to permit axial adjustment to compensate for wear.

- (3) Impeller Shaft: The impeller shaft shall support the impellers and shall be of ground and polished Type 416 stainless steel, ASTM A582M-95b. The shaft shall be supported by suitable noncorrosive bearings on both sides of each impeller with positive means for water lubricating each bearing. The shaft shall be threaded at the lower end to receive an assembly nut to accurately locate the shaft with respect to the bowls during assembly of the bowl unit. The bottom case bearing shall silicon bronze or other approved material.
- (4) Suction Case: The suction case shall connect the strainer to the pump bowls and house the bearing which supports the bottom portion of the impeller shaft. The suction case shall be of cast iron construction conforming to ASTM 1003, properly designed to guide water from the well to the first impeller with minimum friction loss.
- (5) Discharge Case: The discharge case shall be of cast iron, ASTM A48, Class 30, and shall contain a bronze bearing to support the upper end of the pump shaft.
- (6) Strainer: The strainer shall be of the cone type. The strainer shall be directly attached to the lower end of the suction case or attached to the suction case by means of a short length of suction piping with suitable couplings. The suction piping shall not exceed one foot in length and shall be of identical size and construction as the discharge column coupling.

The strainer shall be Type 316 stainless steel (ASTM A744M-00). The net inlet area of the strainer shall not be less than three times the suction case area. The maximum opening shall not be more than 75 percent of the minimum opening of the water passage through the bowl or impeller.

B. DISCHARGE HEAD ASSEMBLY: The discharge head assembly shall consist of a head baseplate, discharge head and head shaft. Replace all existing mounting fasteners with new fasteners of equal quality, grade, etc.

- (1) Head Baseplate: A new baseplate shall be installed, inclusive of fasteners. The Contractor shall paint the new baseplate to match the existing color. Baseplate shall be sized per the pump manufacturer's recommendations and in accordance with the existing field conditions.
- (2) Discharge Head and Mechanical Seal: The existing discharge head and mechanical seal shall be replaced with new. The existing discharge head shall be replaced with new and its discharge flange shall be sized as specified. The fasteners for the existing discharge head shall be replaced with new to secure both the new discharge head and new sole plate to the existing concrete pump base. The Contractor shall be responsible to insure that the flange of new discharge head shall align with new aboveground discharge piping. The mechanical seal in the discharge head shall be a John Crane, Durametallic, or approved equal with a minimum pressure rating of 150 psi.
- (3) Head Shaft: The existing head shaft shall be replaced with new. The head shaft shall be ground and polished Type 416 stainless steel conforming to ASTM A 582. The head shaft shall not be longer than ten feet and shall be of the size as called for in these specifications. A suitable method shall be provided on the top of the head shaft to allow impeller adjustment by means of an adjusting nut. The nut shall be provided

with a positive locking device. Straightness and machining tolerances shall be as specified under the "Line Shaft" section of these specifications.

- (4) Head Shaft Coupling: The existing head shaft coupling shall be replaced with new. The line shaft and the head shaft shall be jointed by a stainless steel coupling with a safety factor of 1.5 times the shaft safety factor. Threads shall be left-hand to tighten during pump operation. Sufficient clearance in the discharge head shall be provided to permit easy access to coupling for repair or removal of mechanical seal without disturbing pump motor.

C. DISCHARGE COLUMN ASSEMBLY: The discharge column assembly shall consist of the discharge column pipe, combination column couplings, line shaft, line shaft couplings, line shaft bearings, air line, and water-level monitoring tube.

- (1) Discharge Column Pipe: The new column pipe shall be, at a minimum, stainless steel pipe to be epoxy coated inside and outside with Tnemec 141 or approved equal. Provide DOW the option for the new column pipe to be Schedule 40 galvanized steel pipe conforming to ASTM A53, Grade B, size and thickness as specified, coated with zinc inside and outside by the hot-dip process. Each section of column shall have straight threads with ends accurately machined to form a butt joint to insure accurately assembled column length and perfect alignment. The pipe shall be furnished in interchangeable sections of not more than ten (10) feet in length. The top end (attached to the discharge head bottom) and the bottom (attached to the top of the pump bowl assembly) of the discharge column pipe shall not exceed five (5) feet in length each.
- (2) Combination Column Couplings: New, combination couplings shall be of cast or ductile iron with an alignment spider cast integrally of the same material. Each spider shall have its own water lubricated bearing properly fitted to maintain the alignment of the shafting and to prevent vibration. The design and material of the combination column coupling furnished shall be approved by the DOW before the pumps are installed. If drop-in stainless steel retainers with rubber inserts is proposed to be provided instead of combination column couplings, submit product information for DOW review and approval.
- (3) Line Shaft: The new line shaft shall connect the head shaft to the impeller shaft. New replacement line shaft shall be ground and polished Type 416 stainless steel conforming to ASTM A582, of the size as called for in these specifications. The line shaft shall be furnished in interchangeable sections of not more than ten (10) feet in length. To insure accurate alignment of the shafts, they shall be straight within 0.005 inch total indicator reading for a ten (10) feet section; the butting faces shall be machined square to the axis of the shaft; the maximum permissible error in the axial alignment of the thread axis with the axis of the shaft shall be 0.002 in 6 inches.
- (4) Line Shaft Coupling: New individual sections of the line shaft shall be connected with ground and polished Type 416 stainless steel sleeve-type couplings conforming to ASTM A582 and sized to receive the specified line shaft. The couplings shall be designed with a safety factor of 1-1/2 times shaft safety factor and shall have a left-handed thread to tighten during pump operation.

- (5) Line Shaft Bearings: The new line shaft bearings shall be water lubricated bearings. The line shaft thermoplastic bearings shall be NSF/ANSI 61 approved and installed on the line shaft section located above the static water level. The thermoplastic bearings shall be Thordon ThorPlas-White or approved equal. The line shaft rubber bearings shall be installed on the line shaft section located at or below the static water level. The rubber bearings shall be Cutlass or approved equal. The new bearings shall be compatible with the new spiders and line shafts. The retainer rings, if used, shall be stainless steel. The maximum spacing between bearings shall be 10 feet.
- (6) Air Line: The new air line in the well is 1/4-inch, Type 316 stainless steel (PVC coated) pipe and shall be terminated at the elevation specified. The air line shall be strapped to the pump column with stainless steel straps no more than ten (10) feet apart.

7.2.06 PUMP MOTOR:

The electric motor shall be vertical hollow shaft with non-reverse ratchet, P-base, squirrel cage induction design, NEMA premium efficiency. Enclosure shall meet NEMA totally enclosed design. Motor shall have Class F insulation with temperature rise as specified by NEMA standards for class of insulation used and shall have a 1.15 service factor. The motor shall be designed for “soft” starting, and capable of continuous operation under the head specified.

The motor shall have a horsepower rating of not less than specified and shall not be loaded in excess of 95% of its nameplate rating at the rated head and capacity of the pump. Additionally, the motor shall not be loaded in excess of 100% of its nameplate rating at any condition from zero flow to the maximum capacity of the pump. The motor shall be capable of operating for a few minutes under shutoff head conditions.

Motor windings shall be encapsulated or sealed with epoxy according to NEMA standards by an insulation system such as Custom Polyseal or approved equal.

Thrust bearings shall be provided as an integral part of the motor and shall be of ample capacity to handle the continuous down thrust as specified by the pump manufacturer. The bearing shall be of such a size that the average life rating based on continuous operation is no less than five (5) years. The bearings shall also have the capacity to allow the pump to operate for at least ten (10) minutes with the discharge valve closed. The motor shall be designed to prevent reverse rotation when the unit is shut down.

Contractor shall be responsible for all modifications to ensure proper fit and match for new motor on new pump discharge head. All electrical connections (splicing and associated work) shall be completed by a certified electrical contractor.

The motor shall be U.S. Motors or approved equal.

The motor shall be manufactured within the previous two (2) years of the date of this contract and the manufacturer’s certificate of compliance shall be provided for DOW approval.

- A. SPACE HEATERS: Motor shall be equipped with space heaters to prevent condensation inside the motor enclosure after motor shutdown and maintain the temperature of the winding at not less than 9-degree F (5-degree C) above outside ambient temperature.

Heaters shall be flexible wraparound type rated 115V, single phase, 60 Hz. The space heater rating in watts and volts shall be noted on the motor nameplate or on a second nameplate. Space heater leads H1 and H2 shall be brought to a separate terminal block or pigtails in the motor box or separate box with a threaded conduit opening.

- B. TEMPERATURE SENSING AND PROTECTION: Motor shall be equipped with over temperature protection. Protection shall be NEMA Type 2 bi-metallic thermal switch (Klixon) type.
- C. TERMINAL BOXES: Provided with threaded hubs. Provide neoprene gaskets at the base of the box and between the halves of the box. Provide a grounding lug located within the box for the cable or raceway ground connection. Boxes shall be designed to rotate in order to permit installation in any of four positions 90 degrees apart. Provide oversized boxes one size larger than standard as a minimum.
- D. NAMEPLATES: Motor nameplates shall be engraved or stamped stainless steel. Information shall include those items enumerated in NEMA Standard MG 1, as applicable. Nameplates shall be permanently fastened to the motor frame and shall be visibly positioned for inspection. Additionally, provide the following information on nameplates or additional nameplates for:
 - (1) NEMA guaranteed minimum efficiency.
 - (2) Explosion-Proof motors: Indicate UL frame temperature limit code.
 - (3) Space heater information.
 - (4) NEMA MG 1 Over Temperature Protection Type Number.
 - (5) Temperature device rating and alarm and shutdown set point information.
- E. CONSTRUCTION: All motors provided under this specification shall have the following features of construction:
 - (1) Cast iron frames. Aluminum frame motors are not permitted.
 - (2) Aluminum rotor material and copper stator windings with F-insulation without exceeding the B-temperature rise of 144-degree F (80-degree C) at rated load and with Design-B torque/current characteristics rated for continuous operation duty.
 - (3) Stamped steel or cast metal fan shrouds with non-sparking fan blades.
 - (4) Non-hygroscopic motor leads.
 - (5) NEMA Design-B as standard design.
 - (6) Service factor of 1.15.
 - (7) Grounding terminal in conduit box.

(8) Stainless steel nameplate.

F. PROTECTIVE COATING: Before shipment, coat the shaft extension and any other external bare exposed metal parts of each motor with an easily removable rust preventive.

G. PACKAGING: All loose motors shall be packed in Styrofoam or securely fastened to a hardwood skid or pallet for fork-truck handling and shall be covered for protection against dirt and moisture during transit and for short-time outdoor storage.

H. FACTORY TESTS: The manufacturer's factory motor Prototype Tests per IEEE Standard 112 Appendix-A on motors through 250 horsepower shall be submitted as Product Data for the motor. Actual factory tests for these motors are not required. The standard routine factory tests shall be conducted, that may include:

(1) Winding resistance in ohms and converted to 77 degree F (25 degree C).

(2) Resistive Unbalance and Quarter Voltage Impedance, as applicable.

(3) Locked-Rotor current (Single phase).

(4) High Potential.

(5) No-Load Excitation (volts, amperes, RPM).

(6) Bearing vibration check.

(7) Efficiency, Power Factor, Current at 115%, 100%, 75%, 50%, and no load.

7.2.07 PRE-LUBRICATION WATER: The pre-lubrication line and its components shall be reconnected to the new pump. The pump installer shall verify that existing flow and pressure conditions for the pre-lube line are acceptable and provide proper lubrication for the pumping unit line shaft. The Contractor shall be responsible for providing any additional valves, piping, parts, associated hardware, or modifications to the discharge head or discharge head connection that are not specified or shown in the drawings, necessary to provide acceptable flow, direction, and pressure conditions onto the line shaft at no additional cost to DOW.

7.2.08 SPARE PARTS: Each bidder shall include in his bid the cost of supplying and delivering the following list of spare part to the DOW:

A. One (1) extra set of packing rings, one (1) set per pump.

B. One (1) extra set of bearings for one (1) motor, one (1) set per motor.

7.2.09 REFURBISHMENT OF EXISTING INCIDENTAL ITEMS: Unless directed otherwise, the Contractor shall replace all existing piping flange fasteners and gaskets removed to facilitate the pump replacement with new materials. New fasteners shall be galvanized, of the same type, grade, size and material as the original, and suitable for the intended service. New flange gaskets shall be non-asbestos containing material and otherwise match the existing. The Contractor shall also replace any miscellaneous piping appurtenances disassembled during the course of the pump repair work and found to be unusable and are necessary for a complete and operating installation.

7.2.10 SUBSTITUTION OF SPECIFIED PUMP: If a specified pump model has been used to dimension plans and specify pump performance characteristics, a substitute pump can be used only if the following conditions have been met:

- A. All changes in dimensions resulting from the substitution of the specified pump shall be the responsibility of the Contractor. The substitution must be approved by the DOW.
- B. The substitute pump shall have performance characteristics equal to or better than the specified pump. Performance characteristics that shall be compared are the required horsepower, efficiency and head-capacity curve.
- C. The DOW shall approve the substitution before the substitute pump is ordered.

7.2.11 PRELIMINARY SUBMITTALS: The Contractor shall obtain written approval from the DOW prior to ordering the pumping unit. The DOW reserves the right to reject any non-approved pumping unit that is ordered and require the Contractor to supply a different pumping unit that meets with DOW's approval at no additional cost. To obtain approval to order the proposed pumping unit the Contractor shall submit one (1) hard copy and one (1) electronic set of the following to the DOW following the requirements of SP-1.6, SP-1.17, and the Water Construction Notes:

- A. PRELIMINARY PUMP CHARACTERSTIC CURVES: The preliminary pump characteristic curves shall show the proposed head, efficiency and brake horsepower vs. capacity of the pump to be furnished.
- B. PUMPING UNIT SPECIFICATIONS: The Contractor shall submit complete specifications for the pump he proposes to furnish. All pumping unit material shall be specified. Provide written verification that all materials meet the revised Reduction of Lead in Drinking Water Act.
- C. THRUST LOAD CURVES: The Contractor shall supply with his proposal a curve showing the thrust load from shutoff head to the lowest head specified. The rating of the thrust bearing being furnished with the motor shall be shown as part of the data on the curve.
- D. CERTIFICATION OF COMPLIANCE WITH ISO 9000 SERIES STANDARDS: The Contractor shall submit certification that the pump and motor manufacturer are registered/certified by the ISO as conforming to the requirements of ISO 9000 series standards.
- E. NSF/ANSI 61 CERTIFICATION: The Contractor shall submit proof of certification that the pump and motor are registered as conforming to the requirements of NSF/ANSI Standard 61.

Provide written verification that all other materials are NSF/ANSI 61 compliant.

7.2.12 MANUFACTURER LABORATORY PUMP TEST: The Contractor shall obtain written approval from the DOW of all curves and data sheets for each bowl assembly to be used before the pumps may be installed. The DOW reserves the right to reject any pump that is installed for which

the Contractor has not obtained approval for and require the Contractor to remove and replace the non-approved pump at no additional cost to the DOW.

To obtain the DOW approval the Contractor shall submit a minimum of one (1) manufacturer-certified hard copy and one (1) electronic set of performance curves and test data sheets of the manufacturer's laboratory running test conducted for each bowl assembly furnished. The running test shall be conducted in accordance with the latest edition of the "American National Standard for Deepwell Vertical Turbine Pumps – Line Shaft and Submersible Types" ANSI B 58.1 to show that the specified conditions can be met by the bowl assemblies furnished. The performance curves shall show the head-capacity, efficiency-capacity, overall efficiency-capacity and required brake horsepower capacity curves for each bowl assembly.

7.2.13 LAYOUT DRAWINGS: The Contractor shall obtain written approval of the pump and piping layout drawings before any construction may begin. The DOW reserves the right to reject any layout drawings that have not been approved and require the Contractor to revise the layout drawings at no additional cost to the DOW. The Contractor, at no additional cost to the DOW, shall redo construction work that is done prior to the DOW's approval of the layout drawings or that is not in accordance with the approved layout drawings. To obtain approval the Contractor shall submit a minimum of one (1) hard copy and one (1) electronic set of pump and piping layout drawings. All dimensions of pump, valves, piping, fittings and appurtenances shall be shown.

7.2.14 INSTALLATION OF PUMPING UNIT: Installation of the pumping units shall be made for the Contractor by a subcontractor holding a C-57A Pump Installation Specialty License for the State of Hawai'i, under the direction of the supplier of the pumping units. The units shall be installed only in the presence of the DOW's Construction Inspector.

The pump installer shall have a minimum of five (5) years experience in the installation, testing, maintenance, and repair of vertical turbine deepwell pumping units of similar capacity, head, setting and horsepower as the pumping unit specified. The pump installer shall also have nearby plant facilities and equipment to immediately repair the pumping units should any emergency arise.

7.2.15 INSTALLATION INSTRUCTIONS AND MAINTENANCE MANUAL: The pump manufacturer shall also provide two (2) hard copies and one (1) electronic copy of instructions for the installation of the pumping units and proper maintenance of the same.

7.2.16 TEST OF PUMPING UNITS: After installation of all machinery and other equipment in the sump, a complete operating test of the pumping unit and other equipment shall be made over a period of seven (7) days.

The Contractor shall make his own arrangements and pay for power and other costs as required.

Throughout the operating test, the pumping unit shall run smoothly without vibration, leaks or heating of the bearings. If during or as a result of this test, any structural or mechanical defect or weakness develops, or if the equipment fails to deliver its required discharge at the respective head under required conditions, the DOW reserves the right to reject any part or all of the equipment and demand reconstruction or replacement to meet the requirements of these specifications.

During the period between the first test and the final acceptance of the pumping unit by the DOW, the unit shall be left in place and in good working condition for use by the DOW in order to provide service, if required, and at no additional cost to the DOW.

After the operating test has been completed to the satisfaction of the DOW, overall efficiency test shall be made in accordance with the Rotodynamic Pumps for Hydraulic Performance Acceptance Tests (ANSI/HI 14.6), 2016 Edition, Hydraulic Institute.

The capacity of each pumping unit will be tested under the head-capacity conditions specified. The overall efficiency of each pumping unit will be the ratio of the water horsepower delivered by the pump to the total electrical power consumed.

The quantity of water delivered is to be based on differential pressure readings of the flow tube. No special calibration shall be made. Tests shall be made with the electric current normally furnished by the KIUC. No correction for variation in the electric power will be allowed.

Should the tests for efficiency for either pumping unit result in an overall efficiency of less than that specified at the guaranteed capacity and head point, the Contractor shall make the changes and replacements, and of any additional tests required shall be paid by the Contractor.

If each pumping unit is capable of pumping the rated capacity under normal operating conditions, the efficiency test may be waived at the option of DOW.

7.2.17 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-8 ELECTRICAL WORK

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SECTION SP-8.1 – GENERAL CONDITIONS

The General Conditions and Special Provisions preceding this Section of Specification shall govern Electrical Work.

8.1.01 INTENT OF SPECIFICATIONS AND DRAWINGS:

- A. Specifications and Drawings are prepared in abbreviated form and include incomplete sentences. Omitted words and phrases shall be provided by inference to form complete sentences.
- B. Specifications and Drawings complement each other and what is specified, scheduled, or mentioned by one shall be binding as if called for by both. Specifications and Drawings are intended to specify nature, quantity, and quality of work.
- C. Before bidding, Contractor shall visit project site and carefully review Specifications and Drawings and obtain from local utility their electrical service requirements. Any error or omissions shall be reported to DOW per the RFP before submission of bids for interpretation or clarification.
- D. The electrical drawings and schedules included in this project are functional in nature and do not specify exact locations of equipment or equipment terminations.

8.1.02 DEFINITIONS

- A. “Provide” means “furnish and install”.
- B. “Wiring” means “provide all raceways, conductors, devices, protective equipment, etc., for a complete electrical system”.
- C. “Approved equal” means qualify material according to paragraph, “Materials and Workmanship”.
- D. “DOW” means the “Department of Water”.
- E. An “elementary or schematic diagram” shows, by means of graphic symbols, the electrical connections, and functions of a specific circuit arrangement. The schematic diagram facilitates tracing the circuit; and its functions without regard to the actual physical size, shape, or location of the component devices or parts.
- F. A “one-line diagram” shows, by means of single lines and graphical symbols, the course of an electrical circuit or system of circuits and the components, devices, or parts used therein. Physical relationships are usually disregarded.
- G. A “block diagram” is a diagram of a system, instrument, computer, or program in which selected portions are represented by annotated boxes and interconnecting lines.
- H. A “wiring or connection diagram” includes all of the devices in a system and shows their physical relationship to each other including terminals and interconnecting wiring in an assembly. This diagram shall be either in a form showing interconnecting wiring by

terminal designation (wireless diagram), or showing actual wire routing between devices. Wiring diagrams shall show wire numbers, DC polarities, colors and sizes.

- I. “Interconnection diagrams” shall show all external connections between terminals of equipment and outside points, such as motors and auxiliary devices. References shall be shown to all connection diagrams which interface to the interconnection diagrams. Interconnection diagrams shall be of the continuous line type. Bundled wires shall be shown as a single line with the direction of entry/exit of the individual wires clearly shown. Wireless diagrams and wire lists are not acceptable. Each wire identification as actually installed shall be shown. The wire identification for each end of the same wire shall be identical. All devices and equipment shall be identified. Terminal blocks shall be shown as actually installed and identified in the equipment complete with individual terminal identification. All jumpers, shielding, and grounding termination details not shown on the equipment connection diagrams shall be shown on the interconnection diagrams. Wires or jumpers shown on the equipment connection diagrams shall not be shown again on the interconnection diagram. Signal and DC circuit polarities and wire pairs shall be shown. Spare wires and cables shall be shown.
- J. An “arrangement, layout, or outline drawing” is one which shows the physical space, weight, and mounting requirements of a piece of equipment. It shall also indicate ventilation requirements and space provided for connections or the location to which connections are to be made.
- K. “Structures” refer to the structural elements of a building that resist gravity, seismic, wind, and other types of loads. Structural components include columns, posts, beams, girders, joists, bracing, floor or roof sheathing, slabs or decking, load-bearing walls, and foundations.
- L. “Nonstructural Components” refer to the nonstructural portions of a building include every part of the building and all its contents, except the structural portions, that carry gravity loads and that may also be required to resist the effects of wind, snow, impact, temperature and seismic loads. Nonstructural components include, but are not limited to, ceilings, partitions, windows, equipment, piping, ductwork, furnishings, lights, etc.
- M. “Non-building Structures” refer to all self-supporting structures that carry gravity loads and that may also be required to resist the effects of wind, snow, impact, temperature and seismic loads. Non-building structures include, but are not limited to, pipe racks, storage racks, stacks, tanks, vessels and structural towers that support tanks and vessels.

8.1.03 REFERENCES

- A. SP-8 specification sections contain references to the following documents. They are a part of these Sections as specified and modified. In case of conflict between the requirements of these Sections and those of the listed documents, the requirements of these Sections shall prevail.

Reference	Title
AASHTO H20	Highway Bridges
ACI 318	Building Code Requirements for Structural Concrete and Commentary
ABMA 11	Load Ratings and Fatigue Life for Roller Bearings
ABMA 9	Load Ratings and Fatigue Life for Ball Bearings
ANSI C57.13	Requirements for Instrument Transformers
ANSI C80.1	Rigid Steel Conduit-Zinc Coated
ANSI C80.3	Electrical Metallic Tubing-Zinc Coated
ANSI/ IEEE C57.12.01	General Requirements for Dry-Type Distribution and Power Transformers
ANSI/ NEMA ICS 1	Industrial Control Systems: General Requirements
ANSI/ NEMA ICS 18	Motor Control Centers
ANSI/UL 506	Specialty Transformers
ASTM A123	Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products
ASTM A143	Safeguarding Against Embrittlement of Hot Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement
ASTM A153	Zinc Coating (Hot Dip) on Iron and Steel Hardware
ASTM A193/ A193M REV C	Alloy-Steel and Stainless Steel Bolting Materials for High Temperature Service
ASTM A384	Safeguarding Against Warpage and Distortion During Hot Dip Galvanizing of Steel Assemblies
ASTM A385	Providing High Quality Zinc Coatings (Hot Dip)
ASTM A48 REV A	Gray Iron Castings
ASTM A780	Repair of Damaged Hot Dip Galvanized Coatings
ASTM B3	Soft or Annealed Copper Wire
ASTM B33	Tinned Soft or Annealed Copper Wire for Electrical Purposes
ASTM B8	Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM F512	Smooth-Wall Polyvinylchloride Conduit and Fittings for Underground Installation
FEDSPEC W-C-1094A	Conduit and Conduit Fittings, Plastic, Rigid
FEDSPEC WW-C-581E	Conduit, Metal, Rigid and Intermediate; and Coupling, Elbow, and Nipple, Electrical Conduit; Zinc Coated
IBC	International Building Code
ICEA S-68-516	Ethylene-Propylene-Rubber-Insulated Wire
IEEE	Institute of Electrical and Electronic Engineers
IEEE 112	Standard Test Procedures for Polyphase Induction Motors and Generators
IEEE 141	Recommended Practice for Electric Power Distribution for Industrial Plants

Reference	Title
IEEE 1584	IEEE Guide for Performing Arc-Flash Hazard Calculations
IEEE 242	Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems
IEEE 81	Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Grounding System
IEEE 841	Standard for Petroleum and Chemical Industry-Severe Duty Totally Enclosed Fan-Cooled (TEFC) Squirrel Cage Induction Motors - Up to and Including 500 HP
JIC EMP-1	Electrical Standards for Mass Production Equipment
MILSPEC DOD-P-21035	Paint, High Zinc Dust Content, Galvanizing Repair
NEC	National Electrical Code
NECA-1	National Electrical Contractors Association – Standard Practices for Good Workmanship in Electrical Contracting
NEMA	National Electrical Manufacturers Association
NEMA 250	Enclosures for Electrical Equipment (1000 volts maximum)
NEMA ICS 6	Industrial Control and Systems Enclosures
NEMA ICS-1	General Standards for Industrial Controls and Systems
NEMA ICS-2	Industrial Control Devices, Controllers, and Assemblies
NEMA ICS-18	Motor Control Centers
NEMA KS 1	Enclosed Switches
NEMA MG 1	Motors and Generators
NEMA PB 2	Deadfront Distribution Switchboards
NEMA ST20	Dry-Type Transformers for General Application
NEMA TC2	Electrical Plastic Tubing (EPT) and Conduit (EPC 40 and EPC 80)
NEMA TC6	PVC and ABS Plastic Utilities Duct for Underground Installation
NEMA WC7	Cross-Linked-Thermosetting Insulated Wire and Cable for the Transmission and Distribution of Electric Energy
NEMA WD-1	General Requirements for Wiring Devices
NETA	International Electrical Testing Association Inc 2009 Acceptance Testing Specifications
NFPA 70	National Electrical Code (NEC)
NFPA 70E	Standard for Electrical Safety Requirements for Employee Workplaces
NFPA 79	Electrical Standards for Industrial Machinery
OSHA 29-CFR, Part 1910, Subpart S	Occupational Safety and Health Standards: Electrical
UL 1	Flexible Metal Electrical Conduit
UL 1004	Motors, Electric
UL 1449	Surge Suppression Devices

Reference	Title
UL 2111	Overheating Protection for Motors
UL 360	Liquid Tight Flexible Electrical Conduit
UL 44	Rubber-Insulated Wires and Cables
UL 489	Molded-Case Circuit Breakers and Circuit Breaker Enclosures
UL 50	Cabinets and Boxes
UL 514	Nonmetallic Outlet Boxes, Flush-Device Boxes and Covers
UL 6	Rigid Metal Electrical Conduit
UL 651	Rigid Nonmetal Electrical Conduit
UL 67	Underwriters Laboratories, Electric Panelboards
UL 797	Electrical Metallic Tubing
UL 83	Thermoplastic-Insulated Wires and Cables
UL 845	Motor Control Centers
UL 870	Wireways, Auxiliary Gutters, and Associated Fittings
UL 884	Underfloor Raceways and Fittings
UL 886	Outlet Boxes and Fittings for Hazardous (Classified) Locations
UL 891	Deadfront Switchboards
WAC 296-46	Safety Standards - Installing Electric Wires and Equipment

8.1.04 MATERIALS AND WORKMANSHIP:

- A. Materials and equipment shall be new and free from defects and shall be listed for the purpose for which they are to be used by an independent testing laboratory. Three such organizations are Underwriters Laboratories (UL), Canadian Standards Association (CSA), and Electrical Testing Laboratories (ETL). Those items listed by Underwriters' Laboratories shall bear the "UL" label of approval. Independent testing laboratory shall be acceptable to the inspection authority having jurisdiction.

When a product is not available with a testing laboratory listing for the purpose for which it is to serve, the inspection authority may require the product to undergo a special inspection at the manufacturer's place of assembly. All costs and expenses incurred for such inspections shall be included in the original contract price.

- B. Where specified in the individual product specification section, factory tests shall be performed at the place of fabrication and performed on completion of manufacture or assembly. The costs of factory tests shall be included in the contract price.
- C. Brand names, manufacturer's names, and catalog numbers indicate standard of design and quality required. Substitute materials may be used if qualified by written permission from the DOW. List of substitute material together with qualifying data shall be submitted for approval in accordance with the RFP and Water Construction Notes.

D. Submission shall be as follows:

EXAMPLE:

	MANUFACTURER AND CATALOG NUMBER	SUBSTITUTE MANUFACTURER AND CATALOG NUMBER
<u>ITEM</u>	<u>SPECIFIED</u>	<u>SUBSTITUTE</u>
CABLE	Joe Doe No. 3200	King 2200

E. Qualifying data shall include catalog cuts, shop drawings, and/or specifications to show equality with materials specified herewith.

F. Applicable rules, standards and specifications of the following associations shall apply to materials and workmanship:

- (1) American National Standards Institute (ANSI)
- (2) National Electrical Manufacturers Association (NEMA)
- (3) Institute of Electrical and Electronic Engineers (IEEE)
- (4) National Board of Fire Underwriters (NBFU)
- (5) Illuminating Engineering Society of North America (IESNA)
- (6) National Fire Protection Association (NFPA)
- (7) Insulated Power Cable Engineers Association (IPCEA)
- (8) U.S. Department of Commerce, National Bureau of Standards (National Electric Safety Code)
- (9) American Society for Testing and Materials (ASTM)
- (10) Underwriters' Laboratories (UL)

G. Comply with local ordinances and regulations of County of Kaua'i. Workmanship subject to approval of DOW. The Contractor shall notify DOW upon completion of underground or concealed work and afford DOW the opportunity to inspect such work prior to burial/concealment. Where the Contractor fails to afford DOW this opportunity, costs to expose work for inspection and re-bury/re-conceal work shall be borne solely by the Contractor.

H. Comply with Hawai'i Revised Statutes HRS§103-50, Americans with Disabilities Act Accessibility Guidelines (ADAAG) and Disability and Communication Access Board (DCAB) Interpretive Opinion 2000-05.

- I. Comply with applicable Rules, Standards, Regulations, and Requirements of the respective utility companies.

8.1.05 DRAWINGS:

- A. These specifications are accompanied by architectural plans of buildings, site plans and diagrammatic electrical plans showing locations of outlets, switches, service runs, feeder runs, devices, and other electrical equipment. Locations are approximate. Before installing, Contractor shall study adjacent construction details and make installation in the most logical manner.
- B. Any device may be relocated within ten (10) feet before installation at direction of DOW without additional cost to DOW.
- C. Before installing, verify all dimensions and sizes of equipment at job site. Circuit and conduit routing is typical and may be altered in any logical manner; however, all changes shall be approved by DOW and shown on record drawings.

8.1.06 DEPARTURES FROM DRAWINGS AND SPECIFICATIONS:

- A. Departures resulting from substitution of materials or system shall be accompanied by appropriate changes in all affected work of every trade. Such changes shall be at no increase in the contract amount and shall be the responsibility of the subcontractor or supplier responsible for the departures. Changes proposed by the Contractor shall be based on a system approach and shall be allowed if implemented without decrease in quality in performance or operations, increase in utility space to install the equipment. Such departures shall be submitted and noted in shop drawings for approval by DOW. Departures initiated by other trades, requiring changes in the electrical system as well as other systems, shall be accompanied by appropriate changes to all affected work of every trade, at no increase in contract amount, by the trade responsible for the departures.
- B. The General Contractor shall be responsible to coordinate, approve, and select systems that do not impose unaccounted for impact on the electrical work. It shall be understood that after the award of contract, all departures having electrical impact, unless otherwise noted, have been coordinated so that all appropriate changes to the electrical system required to accommodate the departures shall be at no additional cost to DOW.

8.1.07 PROJECT/SITE CONDITIONS:

The project location is an operating facility that cannot be shut down for any extended period. The Contractor shall plan work on existing equipment and circuitry to limit service interruptions to the lowest practical time period, and to meet the requirements specified in the Contract Documents.

Contractor shall verify the location of existing equipment, piping, and appurtenances. Contractor shall not disturb and shall maintain in service all existing piping, appurtenances, electrical conduits, and wiring unless otherwise specified. Locations are approximate. See mechanical drawings for locations of piping and equipment.

See mechanical drawings for additional equipment demolition not shown on electrical drawings. Where mechanical equipment is to be demolished, associated electrical work and devices shall be

removed. Wire and cable shall be removed back to the applicable panel, switchboard, or motor control center.

The main control room of the Control Building and the entire interior of the Generator Shelter shall be designated as NON-CORROSIVE, PROCESS AREAS.

The chlorination room of the Control Building shall be designated as a CORROSIVE, PROCESS AREA.

The entire outdoor area at the site shall be designated as a CORROSIVE, PROCESS AREA.

8.1.08 STORAGE OF MATERIALS AND EQUIPMENT:

During the interval between the delivery of equipment to the site and installation, all equipment, unless otherwise specified, shall be stored in an enclosed space affording protection from weather, dust and mechanical damage and providing favorable temperature, humidity and ventilation conditions to ensure against equipment deterioration. Manufacturer's recommendations shall be adhered to in addition to these requirements.

Equipment and materials to be installed indoors shall be stored indoors and sealed with plastic film wrap.

Equipment and materials to be installed outdoors may be stored outdoors if protected against moisture condensation. Equipment shall be stored at least 6 inches above ground. Temporary power shall be provided to energize space heaters or other heat sources for control of moisture condensation. Space heaters or other heat sources shall be energized without disturbing the sealed enclosure.

Electrical equipment and panels found to contain moisture shall be subject to rejection for incorporation into the work at the sole discretion of DOW. Any electrical equipment or panels found to be unacceptable to DOW shall be identified as rejected by DOW and removed from the project site by the Contractor. The Contractor, at no additional cost to DOW, shall replace rejected electrical equipment and panels.

8.1.09 CONSTRUCTION METHODS:

Construction shall conform to construction practices as recommended by the American Electricians Handbook by Croft (latest edition), Edison Electrical Institute, National Electric Safety Code; Applicable Rules, Standards, Regulations, and Requirements of respective utility company; ADAAG & DCAB requirements; and Applicable Instructions of manufacturers of equipment and material supplied for this project.

The Contractor shall note that the electrical drawings do not show all circuited equipment or components in their entirety. The mechanical and instrumentation drawings shall be referenced for complete information regarding the general arrangement and location of circuited components. These referenced documents shall be used in conjunction with the equipment specifications and the electrical schedules to determine the complete circuiting requirements under this Contract.

Unless otherwise detailed or dimensioned, electrical layout drawings are diagrammatic. The Contractor shall coordinate the final location of electrical material or equipment in conjunction

with actual equipment specifications and coordination with other construction. Minor changes in location of electrical material or equipment made prior to installation shall be made at no cost to DOW.

A. EQUIPMENT COORDINATION:

The Contractor shall coordinate the equipment supplied from various manufacturers and vendors. This includes but is not limited to:

- (1) Obtaining specific information on equipment ratings and sizes and verifying that electrical components supplied meet, or match the requirements such as voltage, phase, frequency, starter types, etc.
- (2) Contractor shall provide equipment that will fit within the space allocated on the Drawings and meet NEC clearances.
- (3) Providing power and control equipment, wiring, and raceways to meet the requirements of the mechanical equipment supplied.

Any discrepancies between the electrical equipment and other equipment shall be brought to the immediate attention of DOW.

B. GROUNDING SYSTEMS:

(1) General:

- a. All ground connections that are embedded or buried in the ground No. 2 AWG and larger shall be by compression connectors utilizing diamond or hexagon dies:
 - 1) Use a hand compression tool for sizes 2/0 and smaller and hydraulic pump and compression head for 2/0 AWG and larger.
 - 2) Tools and dies: Approved for the purpose with dimple compressions prohibited.
 - 3) Prepare compression connections in accordance with manufacturer's instructions.
- b. Make embedded and buried ground connections by irreversible compression connectors utilizing diamond or hexagon dies. Use hand compression tool for wire sizes 2/0 AWG and smaller and a hydraulic pump and compression head for wire sizes larger than 2/0 AWG.
- c. DOW shall be notified a minimum of 24 hours prior to backfilling over grounding system in accordance with the Water Construction Notes. Final connections to ground rods and equipment may be made by the exothermic weld process or irreversible compression connection. Exothermic weld procedures outlined in the Cadweld instructions shall be followed:
 - 1) Molds shall not be altered in the field.

- 2) Exposed ground connections to equipment shall be made by bolted clamps unless otherwise specified.
 - 3) No solder shall be used in any part of the ground circuits.
 - 4) Embedded ground cables and fittings shall be securely attached to concrete reinforcing steel with tie wires and prevented from displacement during concrete placement. Ground cable connection to reinforcing steel shall be with exothermic weld or irreversible compression connection.
- d. Extend grounding conductors that extend beyond concrete surface for equipment connections a sufficient length to reach the final connection point without splicing. Minimum extension length shall be 4 feet.
 - e. Locate grounding conductors that project from a concrete surface as close as possible to a corner of the equipment pad, protected by PVC conduit.
 - 1) Ground conductors passing thru concrete floors and wall shall be placed inside PVC conduit. PVC conduit opening shall be flush with concrete surface. Seal space around grounding conductor and conduit.
 - f. Ground conductors, except signal conductor shields, entering enclosures shall be bonded together to the enclosure if it is metallic and to metallic raceways within or terminating at the enclosure. Prior to making ground connections or bonds, the metal surface at the point of connection shall be cleaned.
 - g. Compression-type lugs shall be used in accordance with manufacturer's instructions.
 - h. Grounding conductor shall not be used as a system neutral.
 - i. Metallic sheaths or shields of shielded power cable shall be terminated by a copper grounding strip provided with cable connection for connection to the grounding system.
 - j. Support exposed grounding conductors by non-corrosive metallic hardware at 4-foot intervals or less up to 2 AWG and at 6-foot interval for above 2 AWG conductors.
 - k. Grounding system shall be provided in compliance with the NEC.
 - 1) Raceway Ground:
 - (a) Metallic conduits shall be assembled to provide a continuous ground path. Metallic conduits shall be bonded using insulated grounding bushings.
 - (b) Provide and install an equipment grounding conductor per NEC for any raceway that contains circuits serving equipment required to be grounded per NEC.

- (c) Grounding bushings shall be connected to the grounding system using conductors sized in compliance with NFPA 70.
- 2) All services, motors, metallic enclosures, raceways, and electrical equipment shall be grounded according to requirements of the National Electric Code. At buildings, bond grounding electrode system to service entrance equipment, raceways, motors, ground type receptacles, and other metallic parts directly exposed to ungrounded electric conductors. Connection shall be made by continuous metal raceways, grounded per NEC 250.64(E) and NEC 250.92, and with conductors.
- 3) All grounding wire runs within buildings shall be copper conductors. Where applicable, all ground wires shall be run together with circuit conductors.
- 4) Duct Bank Ground:
 - (a) Duct bank grounding conductor shall be bonded to the ground bus of the source and /or destination equipment where the duct bank is routed from or to a panel or equipment.
 - (b) Duct bank grounding conductor shall be bonded to the source and/or destination building ground electrode system where the duct bank is routed from or to buildings.
 - (c) Duct bank ground conductor may be spliced in order to ground separate manholes or handholes. The splices shall be compression type.

C. CONDUITS AND RACEWAYS:

- (1) Exposed conduit: Install parallel or perpendicular to structural members and surfaces. Install conduit horizontally and allow minimum headroom of 7 feet.
- (2) Route two or more exposed conduits in the same general routing parallel with symmetrical bends.
- (3) Space exposed conduit installed on supports not more than 10 feet apart. Space multiple conduits in parallel and use framing channel.
- (4) Secure conduit rack supports to concrete walls and ceilings with cast-in-place anchors or framing channel concrete inserts.
- (5) Install conduits with spacing from any heat source that would place the conduit in an ambient above 104 degrees F.
- (6) Install conduits between the reinforcing steel in walls or slabs that have reinforcing in both faces. The maximum nominal diameter for conduit in concrete walls or floors shall be 1-1/4 inches unless specifically noted otherwise in the contract drawings or raceway schedules. Larger conduits shall be installed direct buried in earth below the floor slabs or exposed for conduits at basement or grade levels, or exposed for other

locations. Refer to the structural specifications for additional requirements for conduits embedded in concrete.

- (7) Place conduits under the reinforcement in slabs with only a single layer of reinforcing steel. Separation between conduits, conduits and reinforcement, and conduits and surfaces of concrete shall be maintained in accordance with ACI 318.
- (8) Route conduit clear of structural openings and indicated future openings.
- (9) Provide conduits with flashed and watertight seals routed through roofs or metal walls.
- (10) Grout conduits into openings cut into concrete and masonry structures.
- (11) Cap conduits or plug flush conduits during construction to prevent entrance of dirt, trash, and water. Cap or plug empty conduits designated as “future”, “spare”, or “empty” and include a pulling line accessible at both ends. Use anti-seize compound on cap and plug threads prior to installation.
- (12) Determine concealed conduit stub up locations from the manufacturer’s shop drawings. Terminate concealed conduit for future use in specified equipment.
- (13) Install conduit flush with structural surfaces with galvanized couplings and plugs. Caps and plugs shall match the conduit system.
- (14) Provide concealed portions of conduits for future equipment where the drawings indicate future equipment. Match the existing installation for duplicate equipment.
- (15) Terminate conduits that enter enclosures with fittings that match the NEMA rating of the enclosure.
- (16) Underground metallic or nonmetallic conduit that turn out of concrete, masonry or earth: Install a 90-degree elbow of PVC-coated rigid steel conduit before emergence above ground.
- (17) Motors shall be connected to the raceway system using liquid-tight flexible conduit.
- (18) Provide O-Z Gedney “Type DX” or Crouse-Hinds “Type XD” bonded, weathertight expansion and deflection fitting for the conduit size where conduit across structural joints that allows structural movement.
- (19) All conduits below finish grade shall be concrete encased polyvinyl chloride (PVC) Schedule 40, as indicated on drawings. All conduit above finish grade or slab shall be hot dipped galvanized rigid steel conduit (GRS), except for conduit transitions from below to above grade shall be PVC coated GRS. PVC coated GRS shall extend a minimum of 6 inches above finish grade of slab.
- (20) Conduits cut square and inner edges reamed. Butt together evenly in couplings.
- (21) Bends and offsets made with hickey, conduit-bending machine, or as recommended by equipment manufacturer. Do not use vice or pipe tee. Bends made so that interior

cross-sectional area will not be reduced. Radius of curve of inner edge of field bend shall not be less than ten times the internal diameter of conduit. Use of running threads not permitted. Where conduits cannot be joined by standard threaded couplings, approved watertight conduit unions shall be used.

- (22) Cap conduits during construction with plastic or metal-capped bushings to prevent entrance of dirt or moisture. All conduits swabbed out and dried before wires or cables are pulled in.
- (23) Insulating bushings and two locknuts installed on each end of every run of conduit at enclosures and boxes. Provide grounding bushings as required for grounding receptacles.
- (24) Securely fastened in place to all outlet boxes and to structure or support. Project adequate number of conduit threads through box for bushings. Anchorage for 1-1/2 inches and smaller conduit shall be made with one-hole conduit straps or clamps; 2 inches or larger conduit shall be anchored with "U" clamps or approved equivalent fittings. All mounting and fastening hardware shall be Type 316 stainless steel.
- (25) Exposed conduit parallel with or at right angles to structural or architectural elements. Securely fastened in place with pipe straps with screws or bolts and spaced not more than 5 feet apart; or with approved beam clamps or approved single or gang pipe hangers spaced not more than 5 feet apart as the conditions require. Vertical runs supported at intervals not exceeding 5 feet by approved clamp hangers. All mounting and fastening hardware shall be Type 316 stainless steel.
- (26) All conduits installed outdoors and exposed shall be painted. PVC conduits shall be painted gray. Other conduits shall be painted to match the surface on which they are installed or to match adjacent equipment. Painting of conduit shall be performed in accordance with the conduit manufacturer's instructions. The conduit surface shall be properly cleaned and prepped prior to painting. Conduit shall receive a prime coat followed by two top coats. The paint selected shall be suitable for use with the conduit material, either PVC or steel, and have no harmful effects on the integrity of the conduit.

D. BOXES AND ENCLOSURES:

- (1) Boxes on exterior walls or outside of buildings shall be minimum NEMA 4X Type 316L (low carbon) or Type 316 stainless steel, weatherproof-rated with threaded hubs and mounting lugs, or as noted. Provide breather/drain fittings for NEMA 4X pullboxes installed outdoors in accordance with SP-7.5.
- (2) Provide outlet boxes in hollow tiles or concealed in other spaces with extensions or raised rings of such depth that metal will be flush with surrounding surfaces of opening.
- (3) Use gang boxes wherever two (2) or more switches are installed at one location. Concealed boxes installed with edges flush with surrounding wall surface. Boxes plumb and exactly flush.

- (4) Boxes shall be independently supported by galvanized brackets, expansion bolts, toggle bolts, or machine or wood screws as appropriate. Wooden plugs inserted in masonry or concrete shall not be used as a base to secure boxes, nor shall welding or brazing be used for attachment.
- (5) Switch boxes shall be mounted 48 inches above the floor. Receptacles installed in cast device boxes shall be located 18 inches above the floor.

E. CONDUCTORS:

(1) General:

- a. Mechanical means for pulling shall be torque-limiting type and not used for #2 AWG and smaller wires.
- b. Pulling tensions shall not exceed wire manufacturer's recommendation.
- c. Conductors shall be identified at both ends. Conductor tag numbers shall be unique.

Conductors which are in parallel or in series between equipment shall have the same conductor number. Neutral conductors shall have the same conductor number. Wherever possible, the conductor number shall be the same as the terminal to which it connects.

When factory-wired equipment has terminal numbers different from the conductor numbers shown on the control diagrams, both shall be shown on the interconnection diagram, and a copy of the interconnection diagram shall be fastened to the inside of the equipment cabinet.

- d. Raceway construction shall be complete, cleaned, and protected from the weather before cable is installed. Where wire or cable exits a raceway or tray, a means of wire or cable support shall be provided.

(2) 600V Conductor and Cable

Conductors in panels and electrical equipment shall be bundled and laced at intervals not greater than 6 inches, spread into trees and connected to their respective terminals. Lacing shall be made up with plastic cable ties. Cable ties shall be tensioned and cut off by using a tool specifically designed for the purpose such as a Panduit GS2B. Other methods of cutting cable ties are unacceptable.

Conductors crossing hinges shall be bundled into groups not exceeding 10 to 15 conductors and protected using nylon spiral flexible covers to protect conductors. Provide oversized plastic panel wiring duct within panels and panelboards.

Slack shall be provided in junction and pull boxes and handholes. Slack shall be sufficient to allow cables or conductors to be routed along the walls. Amount of slack shall be equal to largest dimension of the enclosure. Provide dedicated electrical

wireways and insulated cable holders mounted on unistrut in handholes. Cables shall be tied to the cable holders in these locations.

Power conductors feeding 480V or higher rated equipment shall be identified by colored phase tape at both ends.

Raceway fill limitations shall be as defined by NEC and the following:

- a. Lighting and receptacle circuits may be in the same conduit in accordance with de-rating requirements of the NEC. Lighting and receptacle circuits shall not be in conduits with power or control conductors. Signal conductors shall be in separate conduits from power conductors. Motor feeder circuits shall be in separate conduits.
- b. Power conductors derived from uninterruptible power supply systems shall not be installed in raceways with conductors of other systems. Install in separate raceways.
- c. Splices and terminations are subject to inspection by DOW prior to and after insulating.
- d. Motor terminations at 460-volt motors shall be made by bolt-connecting the lugged connectors.
- e. In-line splices and tees, where approved by DOW, shall be made with tubular compression connectors and insulated as specified for motor terminations. Splices and tees in underground handholes or pull boxes shall be insulated using Scotch-cast epoxy resin or Raychem splicing kits.
- f. Terminations at solenoid valves, 120 volt motors, and other devices furnished with pigtail leads shall be made using self-insulating tubular compression connectors within the termination box.

(3) Signal Cable:

Provide terminal blocks at instrument cable junctions within dedicated terminal boxes provided by the installer. Signal circuits shall be run without splices between instruments, terminal boxes, or panels.

Circuits shall not be made using conductors from different pairs.

Shields are not acceptable as a signal path, except for circuits operating at radio frequencies utilizing coaxial cables. Common ground return conductors for two or more circuits are not acceptable.

Shields shall be bonded to the signal ground bus at the control panel only and isolated from ground at the field instrument or analyzer and at other locations. Shields or drain wires for spare circuits shall not be grounded at either end of the cable run. Terminals shall be provided for running signal leads and shield drain wires through junction boxes.

Spare circuits and the shield drain wire shall be terminated on terminal blocks at both ends of the cable run and be electrically continuous through terminal boxes.

Where instrument cable splicing is required, provide an instrument stand with terminal box mounted approximately 3 feet high for instrument cable splices with the circuits and individual conductors provided with label as specified in this Section.

Cable for security and telephone systems shall be installed and terminated in compliance with the manufacturer's recommendations.

F. SPLICING:

- (1) Wires shall be formed neatly in enclosures and boxes.
- (2) Splices made according to NEC. Conductors #10 and smaller twisted and dip soldered. Conductors #8 through #4/0 spliced with solderless clamp or compression (indent) connectors.
- (3) Splices reinsulated according to wire manufacturer's instructions. Splice insulation shall be 150 percent in thickness of original wire insulation and of the same electrical and mechanical characteristics. Insulating type (600V use) shall be neoprene, Okoprene by Okonite Company or approved equal. Jacketing and insulating tape shall be high density cold setting polyethylene adhesive tape, Scotch Super 33+ by 3M Company or approved equal.

G. WIRE MARKERS:

Each conductor shall be identified at each terminal to which it is connected. Conductors size No. 8 AWG or smaller shall have identification sleeves. Conductors shall be identified in accordance with paragraph SP-8.1.09.E. The letters and numbers that identify each wire shall be machine printed on sleeves with permanent black ink.

The figures shall be 1/8-inch high. Sleeves shall be yellow or white tubing, sized to fit the conductor insulation. The sleeves shall be shrunk to fit the conductor with hot air after installation.

They shall be TMS Thermofit Marker System by Raychem Co., sleeve style wire marking system by W. H. Brady Co., or approved equal. Adhesive strips are not acceptable.

Conductors No. 6 AWG and larger shall use slotted tags, each secured to the cable with two nylon tie-wraps. Tags shall be white plastic with conductor identification number permanently embossed.

Power conductors feeding 480V or higher rated equipment shall be identified in accordance with paragraph SP-8.1.09.E.2.

H. RACEWAY MARKERS:

Raceway markers shall be 22 gauge minimum thickness, solid Type 316 stainless steel tags with raceway number laser engraved 3/16-inch minimum height characters. Tags shall be

attached to the raceway with Type 316 stainless steel wire. Raceway markers shall be as manufactured by Impact Inc., or approved equal.

I. NAMEPLATES:

(1) Exposed:

Nameplates shall be made from laminated phenolic plastic. The nominal size of the nameplates shall be 3/4 inches high by 2 inches wide. Nameplates shall have black backgrounds with 3/16-inch white letters. If abbreviations are required because of space limitations, abbreviations shall be submitted to DOW prior to manufacture.

Nameplates shall be fastened using self-tapping Type 316 stainless steel screws. The use of adhesives will not be permitted on the outside of enclosures.

(2) Interior:

Nameplates located inside equipment enclosures shall be machine embossed metal tags.

J. PANELBOARDS:

The Contractor shall type in the circuit description on the circuit directory as shown on the final record drawings or panelboard schedule.

Provide "Circuit Directory and Circuit Identification" in accordance with NEC 408.4. Each circuit shall be of sufficient detail to allow each circuit to be distinguished from other circuits. Circuit identification shall include load location and provide equipment or instrument Tag Number and Tag Description, where shown on the drawings.

K. DRY-TYPE TRANSFORMERS (600 VOLTS AND LESS):

(1) Bond/ground transformers per the drawings.

(2) Install transformers on walls or floors at locations shown on the Drawings. Install floor mounted transformers on raised concrete bases. Provide sufficient access and working space for ready and safe operation and maintenance.

(3) Mount transformers so that vibrations are not transmitted to the structural parts of the building or to other equipment. Make connections to transformers with flexible conduit.

(4) Adjust tap settings to provide proper voltage at panelboards.

(5) Ground transformer in conformance with the National Electrical Code.

L. ELECTRIC MOTORS:

(1) Grounding and Bonding

Verify the circuit ground cable (green) is identified and connected to the grounding lug in the motor terminal box.

M. MOTOR CONTROL CENTER:

The motor control center shall be erected in accordance with the recommendations of the manufacturer and with the details specified herein.

Field wiring shall meet the requirements of this Section. Cables larger than No. 6 AWG which hang from their vertical connections shall be supported within 2 feet of the connection.

The solid-state overload relay and soft starter settings shall be implemented by the Contractor with the settings selected based on the actual full load amperes of the motor connected to the starter and the requirements of the motor-driven equipment. Refer to the manufacturer's literature for setting the protection parameters.

Circuit breakers shall be adjusted by the Contractor to the lowest setting not causing false tripping or as otherwise determined by the coordination study.

Install motor control center level and plumb and bolted to concrete housekeeping pad per the manufacturer's installation instructions.

For motor control centers that are to be installed into existing electrical rooms, provide shipping splits as required to allow installation through existing doors and passages to the final mounting locations.

N. TERMINAL BLOCKS:

(1) Power and Control:

Unless otherwise specified, terminal blocks shall be panhead strap screw type. Terminals shall be provided with integral marking strips which shall be permanently identified with the connecting wire numbers as shown on the drawings.

Terminal blocks for P-circuits (power 120-600 volts) shall be rated not less than the conductor current rating and shall not be rated less than 600 volts AC. Terminal blocks for C-circuits (control and/or 120 volts or less power) shall be rated not less than 20 amperes and shall not be rated less than 600 volts AC.

(2) Signal and Instrumentation:

Terminal blocks for S- and J-circuits (signal and instrumentation) shall be rated not less than 20 amperes at 300 volts AC. Terminals shall be tin-plated. Signal and instrumentation terminal blocks shall be cage-clamp spring type, Wago Corporation, Phoenix Contact, or approved equal.

O. INDICATING LAMP COLORS:

Unless otherwise noted, the following color code and inscriptions shall be followed for service legends and lens colors of all indicating lights:

Function	Inscription	Color
Open	Open	Red
Closed	Closed	Green
Fail	Fail	Amber
Warning Alarm	*****	Amber
Auto	Auto	Yellow
Manual	Manual	White
Local	Local	White
Remote	Remote	Blue
Control Power	Control Power	White
On		
Run	Run	Red
Ready	Ready	Green
Stopped	Stopped	Green
Supervisory	On Supervisory	White

P. PUSHBUTTON COLORS:

Unless otherwise noted, the following color code and inscriptions shall be followed for all pushbuttons:

Function	Inscription	Color
Reset	Reset	Red
Emergency Stop	E-Stop	Red
All Others	As Required	Black

Q. CONTROL STATIONS, AND SAFETY DISCONNECT SWITCHES:

Control stations, contactors and safety disconnect switches shall be mounted 48 inches above the floor, ground, or slab to center of device.

R. EQUIPMENT FINISH:

Unless otherwise specified, electrical and instrumentation equipment and materials shall be coated by the equipment manufacturer as specified below.

- (1) Finish: Electrical equipment shall be treated with zinc phosphate, bonderized or otherwise given a rust-preventive treatment. Equipment shall be primed, coated with enamel, and baked. Minimum dry film thickness shall be 3 mils.

Before final acceptance, the Contractor shall touch up scratches on equipment with identical color coating. Finish shall be smooth, free of runs, and match existing finish. Prior to touching up scratches, Contractor shall fill them with an appropriate filler material approved by DOW

- (2) Color: Exterior color of electrical equipment shall be FS 26463 (ANSI/NSF 61) light gray. Interior shall be painted FS 27880 white. Nonmetallic electrical enclosures and equipment shall be the equipment manufacturer's standard grey color.

Exterior color of instrumentation panels and cabinets mounted indoors shall be FS 26463 light gray; unless otherwise specified, exterior color for cabinets mounted outdoors shall be FS 27722, white. Cabinet interiors shall be FS 27880, white.

S. TESTING:

- (1) General:

Prior to energizing the electrical circuits, the following tests shall be performed. Unless otherwise specified, a 1,000 volt megohmmeter shall be used for insulation resistance measurements. This testing shall be done for new conductors and existing conductors that are physically re-installed in raceways or trays.

The test measurements shall be recorded on the specified forms and provided in accordance with submittal requirements specified in this Section.

DOW reserves the right to witness testing activities. The Contractor shall notify DOW not less than 48 hours prior to the commencement of any testing activity.

- (2) Insulation Resistance Measurements:

- a. General: Insulation resistance measurements shall be made on conductors and energized parts of electrical equipment. Minimum acceptable values of insulation resistance shall be in accordance with the applicable ICEA, NEMA, or ANSI standards for the equipment or material being tested, unless otherwise specified. The ambient temperature at which insulation resistance is measured shall be recorded on the test form. Insulation resistance measurements shall be recorded in a format similar to Form SP-7-A, contained in Section SP-8.1. Insulation with resistance of less than 10 megohms is not acceptable.
- b. Conductor and Cable Tests: The phase-to-ground insulation resistance shall be measured for all circuits 120 volts and above, except lighting and receptacle circuits. Measurements may be made with motors and other equipment connected, except that solid state equipment shall be disconnected unless the equipment is normally tested by the manufacturer at voltages in excess of 1000 volts DC.
- c. Motor Tests: The Installed Motor Test Form, SP-7-B, contained in Section SP-8.1, shall be completed for each motor after installation. All motors shall have their insulation resistance measured before they are connected. Motors 60 HP and larger shall also be tested in accordance with Section SP-8.1.10.H.7. Insulation resistance values less than 10 megohms are not acceptable.

- (3) Prefunctional Checkout:

Prior to functional testing, all protective devices shall be adjusted and made operative. Prior to energization of equipment, the Contractor shall perform a functional checkout

of the control circuit. Checkout shall consist of energizing each control circuit and operating each control, alarm or malfunction device, and each interlock in turn to verify that the specified action occurs. The Contractor shall provide a description of the proposed functional test procedures prior to the performance of functional checkout.

The Contractor shall verify that motors are connected to rotate in the correct direction. Verification may be accomplished by momentarily energizing the motor, provided the Contractor confirms that neither the motor nor the driven equipment will be damaged by reverse operation.

T. ELECTRICAL EQUIPMENT LABELING:

Electrical equipment shall have field marked signs and labeling to warn qualified persons of the potential electric arc flash hazards per NEC Article 110.16 Flash Protection.

Electrical equipment shall have NFPA 70E labels installed stating the results of the Arc Flash analysis specified in SP-7.8 Arc Flash Hazard Analysis and Short Circuit/Coordination Study.

Electrical distribution equipment and utilization equipment shall be field labeled to identify the power source and the load as specified. Refer to NEC Article 110.22 for Identification of Disconnecting Means installation criteria. Specific information is required such as the equipment tag number and equipment description of both the power source and the load equipment.

U. FINISHING:

- (1) Structural and architectural elements cut or drilled for installation of electrical system or otherwise affected by work shall be patched, repaired, and restored to the satisfaction of DOW at no additional cost to DOW. Drilling, cutting, patching, repairing, and restoring subject to approval and satisfaction of DOW.
- (2) Attachment of electrical equipment to wood by wood screws. Attachment to concrete by embedded or expansion inserts and bolts. Powder charge driven fasteners shall be used only with the approval of DOW. Close all unused knockouts on boxes or enclosures with metal cap.
- (3) Wipe clean all exposed raceways and enclosures with rag and solvent. Raceways shall be painted in accordance with this Section. Factory finished enclosures that have been damaged during installation shall be retouched to match the original finish. Panelboards shall be identified by stenciling with paint on back of doors the voltage and designation. Voltage ratings stenciled on the front of disconnect switches and junction boxes where wires are terminated for connection to equipment that are not part of this contract.
- (4) Blockouts in concrete and masonry walls for raceways and cables shall be sealed following final testing. Cables passing through such blockouts shall be spread evenly to limit heat build-up.

8.1.10 EQUIPMENT AND FUNCTIONAL TESTING REQUIREMENTS

Functional testing of electrical equipment shall be coordinated with DOW. Testing shall be conducted over a period of not less than seven (7) days to verify correct operation. If any equipment should fail to operate properly within this 7-day period, the Contractor shall correct the installation, and the 7-day test period shall restart (equipment must operate continuously without issue or failure for not less than 7 days). Seven-day functional testing requirement shall apply to all electrical equipment at time of commissioning, including temporary systems.

Electrical tests shall be conducted per the requirements specified in the NETA Acceptance Testing Specifications (NETA ATS), current edition, as described and/or modified within this Section. Testing shall be conducted by a NETA qualified testing agency or major equipment vendor (Siemens, GE, Eaton, Square D or approved equal) as described in the NETA Acceptance Testing Specifications except as noted elsewhere within this Section. Where the testing agency is referred to in this specification, it shall be in reference to this NETA qualified testing firm.

Testing specified within this Section shall include all electrical equipment specified in SP-8, all electrical rotating equipment, and any power distribution electrical apparatus specified under other specification sections in this Contract. Where testing in accordance with this Section is required, the required tests, including correction of defects and retesting, shall be completed prior to energization of material, equipment, or systems.

A. SUBMITTALS:

Submittal requirements for equipment and functional testing specified in Section SP-8.3.

B. TESTING EQUIPMENT AND MATERIALS:

Test instruments shall be calibrated to references traceable to the National Institute of Standards and Testing and shall have a current sticker showing date of calibration per manufacturer's specifications, deviation from standard, name of calibration laboratory and technician, and date of recalibration.

C. DIVISION OF RESPONSIBILITY:

Contractor responsibilities for providing information required by the testing agency that are listed in NETA ATS are as follows:

- (1) The Contractor shall provide an approved copy of the short-circuit analysis, coordination study, arc flash report, and protective device setting report that are specified in SP-7.8.
- (2) The Contractor shall provide the required equipment instruction manuals requested by the testing agency.
- (3) The Contractor shall provide a copy of the list of equipment that will be tested under this Contract.
- (4) The Contractor shall be responsible for providing suitable power for testing as required by the testing agency.

- (5) The Contractor shall be responsible for coordinating the scheduling of testing with the testing agency and shall be responsible for ensuring that equipment is prepared as required for testing by the testing agency.
- (6) The Contractor shall be responsible for providing the site-specific hazard and safety training called for in NETA ATS.
- (7) Testing agency responsibilities shall be as listed in NETA ATS.
- (8) The Contractor shall provide a set of up-to-date Contract Documents for the testing agency.

D. SAFETY, TEST EQUIPMENT CALIBRATION, AND REPORTS:

Conform to the safety requirements specified in NETA ATS.

Test equipment shall be calibrated to the requirements specified in NETA ATS.

Test reports shall include all of the requirements listed in NETA ATS. Equipment Identification shall include the equipment name and number per the project standards.

E. THERMOGRAPHIC SURVEYS:

In the following specified testing for bolted connections, a choice is generally given for testing via thermographic means or millivolt drop testing or torque tightening verification. In such cases, either the millivolt drop test or torque tightening verification shall be conducted in addition to the thermographic scan. Thermographic scan testing shall be completed near the end of construction or during the commissioning phase of the project. At a minimum the new equipment must be subject to normal load conditions when the thermographic scan takes place.

F. OPTIONAL TESTS:

Testing requirements referenced in these specifications include all of the NETA ATS applicable test requirements for the equipment type. Tests identified as optional in the NETA ATS documents are required only where specifically called for in these specifications.

G. TEST REPORTS:

- (1) Provide test reports in conformance with the NETA specifications for test reports and utilize the test forms in this Section as the basis for developing the test forms for this project.
- (2) Use the project full equipment name and equipment number for equipment identification.
- (3) Provide a copy of the final test report in electronic Microsoft Office Word format on CD ROM. Images in the report may be in JPEG or Adobe Acrobat PDF format.

H. TESTING:

(1) Low Voltage Dry Type Transformers:

Perform all testing as specified in the NETA ATS Low Voltage, Small, Dry Transformer testing requirements.

(2) Low Voltage Cable, 600V Maximum:

- a. Low voltage cable testing shall include all low voltage power and control circuits operating at 120V or higher except for circuits that feed lights or receptacles.
- b. Perform testing per NETA ATS requirements for low voltage conductors.

(3) Molded Case Circuit Breakers:

Test molded case circuit breakers in motor control centers and 480V distribution panels to the requirements called for in the NETA specifications for testing molded case circuit breakers.

- a. Primary current injection testing will be required only for main and tie breakers and for feeder breakers or motor circuit protectors rated 100A or more.
- b. Test ground fault features per NETA ATS ground fault testing requirements.

(4) Instrument Transformers:

Test per NETA ATS requirements for instrument transformers.

(5) Metering:

- a. Test metering devices per NETA ATS requirements.

(6) Grounding Systems:

- a. Test grounding per NETA ATS requirements.
- b. Fall of potential testing shall be conducted for each building grounding system.
- c. The Contractor shall test each grounding connection to determine the ground resistance. The grounding test shall be IEEE Standard 81. A plot of ground resistance readings for each isolated ground rod or ground mat shall be provided to DOW on 8-1/2 x 11-inch size graph paper. The current reference rod shall be driven at least 100 feet from the ground rod or grid under test. The measurements shall be made at 10-foot intervals beginning 25 feet from the test electrode and ending 75 feet from it, in direct line between the ground rod or center of grid and the current reference electrode.
- d. A grounding system that shows greater than 2 ohm resistance for the flat portion of the plotted data shall be considered inadequately grounded. The Contractor

shall add additional parallel connected ground rods and/or deeper driven rods until the ground resistance measurements meet the 2 ohm requirement. Ground rods required over those specified will be paid for as extra work. Use of salts, water, or compounds to attain the specified ground resistance is not acceptable.

(7) Electric Motors:

- a. Insulation resistance testing shall be performed for new motors 50 horsepower and larger and any variable frequency drive powered motors. Tests for acceptability will be made using a 1,000V megohm meter (megger). Interpretations of test results for minimum acceptable values of insulation resistance will be made in accordance with IEEE No. 43. All deficiencies shall be corrected by the Contractor at no cost to DOW.
- b. All motors operating at 480V or higher shall be tested per NETA ATS specifications for rotating machinery testing.
- c. Verify that motors are connected to rotate in the correct direction with the load disconnected. Verification may be accomplished by momentarily energizing the motor, provided the Contractor confirms that neither the motor nor the driven equipment will be damaged by reverse operation.
- d. Motor running current shall be measured on each phase with the motor operating under load. Current imbalance shall be less than 5 percent difference between phases.

(8) Low Voltage Motor Starters:

- a. Test low voltage motor starters per NETA ATS specifications.
- b. Verify that the solid-state overload settings are correct per the motor nameplate data.
- c. Discrete remote control features shall be tested to the extent that they can be tested from the terminals of equipment provided in the motor control centers.

(9) Motor Control Centers:

Test motor control centers per NETA ATS specifications, motor control centers, and the related sections for components.

(10) Low Voltage Switchboards:

Test low voltage switchboards per NETA ATS specifications, low voltage switchboards, and the related sections for components.

(11) Capacitors:

Test power factor capacitors per NETA ATS specifications.

I. FUNCTIONAL TESTING:

- (1) Electrical function testing may be performed by qualified electricians (not required to be done by an independent test agency) or by the independent testing agency specified under this Section.
- (2) Submit a description of the functional test procedure prior to the performance of the functional checkout.
- (3) Perform the functional test per NETA ATS specifications for function tests and the requirements of this paragraph prior to energization of the equipment.
- (4) Application specific electrical functional performance testing of equipment is described in the individual equipment specifications.

J. LOOP WIRING AND INSULATION RESISTANCE TESTING:

- (1) Electrical power and signal cable ring-out and resistance testing. Conducted in accordance with Section SP-8.1. Wiring tests shall not be conducted until cables have been properly terminated, tagged and inspected.
 - a. Power and Control: Per Section SP-8.1.
 - b. Signal: Test form SP-8-E.

8.1.11 RECORD DOCUMENTS:

Record documents refer to those documents maintained and annotated by the Contractor during construction, and include all Contract Drawings marked up with any RFI and submittal changes along with original submittal drawings.

8.1.12 MEASUREMENT AND PAYMENT:

A. COMPENSATION: No separate payments will be made for the work covered by this section of these specifications. All costs in connection with furnishing and installing of the various items in accordance with standard practice, the details shown on the drawings and in accordance with these specifications, shall be included in the lump sum price of which the item is a part.

B. KAUA'I ISLAND UTILITY COOPERATIVE (KIUC) COSTS:

The Contractor shall pay for all KIUC installation costs associated with this project.

KIUC work at Kīlauea Wells shall include but not be limited to:

- (1) Disconnection of existing secondary cables
- (2) Termination of new secondary cables
- (3) De-energization and re-energization of the existing transformer

- (4) Installation of new KIUC meter and instrument transformers, including all associated wiring and connections.
- (5) Removal of the existing KIUC meter.
- (6) Assistance with modifications to the existing transformer pad for additional conduits to be installed for the new service, including lifting the transformer, if required.

SP-8-A. WIRE AND CABLE RESISTANCE TEST DATA FORM:

Wire or Cable No.: _____ Temperature, °F _____

Location of Test	Insulation resistance, megohms
1.	
2.	
3.	
4.	
5.	
6.	
7.	

CERTIFIED _____ Date _____
 Contractor's Representative

WITNESSED _____ Date _____
 DOW's Representative

SP-8-B. INSTALLED MOTOR TEST FORM:

Motor Equipment Number _____ Date of Test _____

Equipment Driven _____

MCC Location _____

				Ambient temp	°F
Resistance:					
Insulation resistance phase-to-ground megohms:					
Phase A		Phase B		Phase C	
Current at Full Load:					
Phase		Current, amps			
Phase		Current, amps			
Phase		Current, amps			
Thermal Overload Device:	Manufacturer/catalog #		Amperes		
Circuit breaker (MCP) setting:					

Motor Nameplate Markings:

Mfr		Mfr Model		Frame		HP	
Volts		Phase		RPM		Service factor**	
Amps		Freq		Ambient temp rating			°C
Time rating				Design letter**			
	(NEMA 1-10.35)				(NEMA MG-1.16)		
Code letter				Insulation class			

**Required for 3-phase squirrel cage induction motors only.

CERTIFIED _____ Date _____
Contractor's Representative

WITNESSED _____ Date _____
DOW's Representative

SP-8-C. DRY TRANSFORMER TEST DATA FORM:

(Note: Use Data Form for dry type transformers with voltage rating of 600 Vac or less and sizes to 167 kVA single phase and 500 kVA three phase. Use NETA Test Forms and Test Procedures for higher voltages and larger transformers.)

Equipment Tag No.: _____ Temperature Rating: _____
 Description/Location: _____ Feeder size/Source: _____
 Primary Voltage: _____ Secondary Voltage: _____ Winding Connection: _____

A. VISUAL INSPECTION

Transformer Inspection	Pass	Fail	Note
1. Nameplate data as specified			
2. Mechanical condition			
a. Free of dents and scratches			
b. Anchored properly			
c. Shipping brackets removed			
d. Spacing from wall per nameplate			
3. Grounding *			
a. Equipment grounding			
b. System grounding			

B. INSULATION-RESISTANCE TESTS: Perform tests with calibrated megohmmeter. Apply 1000 Vdc test voltage for 60 seconds and record readings in megohms at 30-seconds and 60-seconds intervals.

Test Group	Resistance between		30-second reading	60-second reading	Absorption Ratio Index 60-sec. / 30-sec.
Primary Winding to ground	A	GRD			
	B	GRD			
	C	GRD			
Secondary Winding to ground with * N-G Bond removed	a	GRD			
	b	GRD			
	c	GRD			
Primary Winding to Secondary Winding	A	a			
	B	b			
	C	c			

Submit resistance readings to DOW immediately after the tests that are less than the manufacturer's recommended value or less than 10-megohms. Record the Absorption Ratio Index values for future reference. Ratio must be 1.0 or greater, with infinity (∞) equal to 1.0.

CERTIFIED (Contractor's Representative): _____ Date _____

WITNESSED (DOW's Representative): _____ Date: _____

SP-8-D. MOTOR CONTROL CENTER/MOTOR CONTROLLER SWITCHBOARD TEST FORM:

Equipment No. _____ Ambient room temperature _____

Location _____

A. MECHANICAL CHECK:

All bolted connections either bus to bus or cable to bus shall be torqued to the manufacturer's recommendations.

B. ELECTRICAL TESTS:

- (1) Measure insulation resistance of each bus section phase to phase and phase to ground for 1 minute using a megohmmeter at 1000 volts.

Test results (megohms)			
Phase		Phase	
A-GRD		A-B	
B-GRD		B-C	
C-GRD		C-A	

- (2) Set the circuit breaker in the starter unit to comply with the requirements of NEC, Article 430-52 and Table 430-152.
- (3) Motor overload heater elements shall be sized and installed based on the actual nameplate full load amperes of the motor connected to the starter.

CERTIFIED _____ Date _____
 Contractor's Representative

WITNESSED _____ Date _____
 DOW's Representative

SP-8-E. LOOP WIRING AND INSULATION RESISTANCE TEST DATA FORM:

Loop No.: _____

List all wiring associated with a loop in table below. Make applicable measurements as indicated after disconnecting wiring.

Wire No.	Panel Tie	Field TB	Continuity Resistance ^a		Insulation Resistance ^b			
			Cond./ Cond.	Cond./ Shield	Shield/ Gnd.	Shield/ Cond.	Cond./ Gnd.	Shield/ Shield
A			--	(A/SH)				
B			(A/B)	--				
C			(A/C)	--				
D			(A/D)	--				
etc.								

NOTES:

- a. Continuity Test. Connect ohmmeter leads between wires A and B and jumper opposite ends together. Record resistance in table. Repeat procedure between A and C, A and D, etc. Any deviation of ± 2 ohms between any reading and the average of a particular run indicates a poor conductor, and corrective action shall be taken before continuing with the loop test.
- b. Insulation Test. Connect one end of a 500-volt megger to the panel ground bus and the other sequentially to each completely disconnected wire and shield. Test the insulation resistance and record each reading.

CERTIFIED _____ Date _____
 Contractor's Representative

WITNESSED _____ Date _____
 DOW's Representative

END OF SECTION

SECTION SP-8.2 SCOPE OF WORK

Provide all articles, materials, equipment, operations, and services herein or on drawings, including all labor, materials, taxes, fees, insurance, and incidentals required to ensure completion.

8.2.01 TEST COMPLETE INSTALLATION: Installation shall be complete in every detail as specified and ready for use. Any item supplied by the Contractor developing defects within one year of final acceptance by DOW shall be replaced by such materials, apparatus, or parts to make such defective portion of the complete system conform to the true intent and meaning of these Drawings and Specifications, at no cost to DOW.

8.2.02 WORK SHALL INCLUDE:

- A. Remove existing primary and secondary motor control centers from the existing well pump control building.
- B. Remove existing power factor correction capacitors and disconnects for each well pump.
- C. Remove existing interior and exterior light fixtures at the well pump control building, including associated conduits, wiring, and light switches. Remove existing general-use receptacles and air compressor receptacle in the well pump control building and associated conduits and wiring.
- D. Remove existing door security switches and associated junction boxes, conduits, and wiring at the well pump control building.
- E. Remove existing 4-20mA signal wiring for the well level transmitters W10 and W20 and well flow transmitters W12 and W22 from the transmitters back to RTU 82. Remove associated exposed conduits within the control building. Existing exterior conduits back to the RTU shall remain.
- F. Field-verify sizes, contents, and routing of existing conduits between the control building and RTU 82 prior to demolition work. Provide existing as-built information to DOW and verify circuits required to be maintained.
- G. Remove existing disconnect switch at each well pump. Remove existing control junction boxes, flexible conduit, and wiring associated with solenoid valves and instruments, except pressure and flow transmitters, at each well pump. Remove existing conduit stub-ups back past the underground elbow at each pump area.
- H. Remove existing electrical service conductors from the KIUC transformer.
- I. Provide temporary electrical equipment, including motor control center, to maintain operation of two well pumps, two chlorine booster pumps, and existing miscellaneous control building 120V loads. Provide panelboard PNL-A in the control building to serve building 120V loads. Provide all temporary conduit and wiring to supply existing electrical equipment from the temporary MCC.
- J. Modify existing service panelboard/manual transfer switch to tap existing bus and provide a temporary feeder to the temporary MCC, including all conduit and wiring.

- K. Provide temporary SCADA RTU connections, including conduit, wiring, and terminal cabinets, where required, to maintain communication of all existing I/O points for control of the well pumps, control of the chlorination system, monitoring of process variables, site security, and other remote control and monitoring functions.
- L. Decommission and remove temporary equipment when no longer required. Salvage and provide equipment to DOW.
- M. Furnish and install all new electrical equipment at the new generator shelter building, including KIUC pullbox and metering equipment, service panelboard, generator terminal cabinet, 208/120V panel PNL-B, lighting, receptacles, door intrusion switches, all associated conduit and wiring, and all other appurtenances and incidentals.
- N. Install new electric service ductbank, including underground concrete-encased conduit and wiring, from the existing KIUC transformer to the KIUC pullbox and metering equipment at the new generator shelter. Install new electric service conduit and wiring from the KIUC metering equipment to the service panelboard.
- O. Install all new electrical ductbank, including underground concrete-encased conduit and wiring, from the new generator shelter to the existing well pump control building. Ductbank shall include both power and controls/signal conduits and wiring.
- P. Furnish and install new motor control center within the existing well pump control building. Motor control center shall include one reduced-voltage solid state motor starter for each well pump, one full-voltage non-reversing motor starter for each chlorine booster pump, power monitoring equipment, and feed to panelboard PNL-A for supplying site 120V loads.
- Q. Provide new SCADA termination cabinet to terminate and relay I/O points from the well pump control building to the existing SCADA RTU cabinet. Provide all associated conduit, boxes, and wiring.
- R. Provide new 4-20mA signal wiring from existing well level transmitters and well discharge flow transmitters to RTU 82. Provide new conduits for signal wiring within the control building and tie in to existing exterior conduits back to RTU 82.
- S. Provide new door security switches and associated conduits, junction boxes, and wiring at the well pump control building.
- T. Provide all new lighting at the well pump control building, including conduits, wiring, and switches. Provide new receptacles for general use and for the existing air compressor, including new conduits and wiring.
- U. Provide all conduit, wiring, and terminations to serve miscellaneous control building 120V loads (currently fed from Panel "P") from panel PNL-A.
- V. Provide two new non-fused disconnect switches and all conduit, wiring, and terminations to maintain control and power to the existing chlorination system, including both chlorine booster pumps and metering pumps.

- W. Provide building grounding systems at both the generator shelter and the well pump control building. Provide a grounding system for the temporary MCC tied to the well pump control building grounding system.
- X. Provide new equipment at each well pump, including new outdoor-rated stainless steel fused disconnect switch, controls junction box, equipment supports, conduits, and wiring.
- Y. Where required, obtain approvals and coordinate all work with KIUC.
- Z. Establish work sequencing, obtain DOW approval, and perform work accordingly to maintain DOW's minimum operational requirements for the station.

8.2.03 ELECTRICAL SEQUENCING CONSTRAINTS:

- A. GENERAL COMMENTS: The contract documents, including the Electrical Work Sequence on Drawing E-006, describe individual work activities and their associated constraints that the Contractor shall include in planning and scheduling the Contract Work in accordance with the given milestones. The Contractor shall submit his own construction schedule and work sequencing plan detailing the order in which activities are to be performed. This shall include shutdown requirements and outage durations for review and approval by the DOW. The proposed construction schedule and sequence that activities follow shall ensure that the frequency and duration of planned outages are minimized. General criteria are as follows:
 - (1) The DOW shall be notified in writing at least fourteen (14) calendar days in advance of any planned outages.
 - (2) Work sequences/cutovers shall be done during DOW approved work hours on Monday through Thursday.
 - (3) Complete station outages shall be limited to no more than 8 hours. The contractor shall restore operation of the station to the satisfaction of DOW at the end of each working day prior to leaving the site.
 - (4) A minimum of one well pump and associated chlorination system shall be operational for the entire duration of construction, except during scheduled complete station outages. Normal operation of the station throughout construction shall maintain both well pumps and associated chlorination system in service via existing, temporary, or new motor control equipment.
 - (5) Prior to energizing electrical equipment, testing shall be performed in accordance with manufacturer recommendations and the specifications.

8.2.04 OPERATIONAL TESTING:

- A. Following the final installation phase, the Contractor shall conduct operational tests to demonstrate that the installed equipment operates according to the plans and specifications. The DOW shall be notified at least seven (7) calendar days in advance of the tests so that the DOW or his designated representative can be present to witness the testing. All conditions of operation of the following installations as applicable shall be tested.

- (1) The motor control center and the pump motor starters and control equipment.
- (2) Surge protective devices.
- (3) Telemetering and supervisory control equipment.
- (4) Valve control and auxiliary equipment.
- (5) Meters, monitors, indicators, and displays.
- (6) Any built-to-order equipment.

B. The Contractor shall be responsible for coordinating these tests with the General Contractor and any other subcontractor or supplier required to be present during the tests. The Contractor shall furnish all necessary measuring or recording equipment for the tests. If there are any failures during the test, the Contractor shall make such repairs or replacements as required at no cost to DOW and shall reinitiate the test.

8.2.05 OTHER WORK INCLUDED:

- A. Concrete, forming, excavation, backfilling and painting provided by respective sections of this contract.
- B. Equipment utilizing electricity shall be provided by respective sections of this contract. Installation of equipment complete with power wiring and electric controls and interlock wiring shall be part of Electrical Work.

8.2.06 MEASUREMENT AND PAYMENT: No separate payments will be made for the work covered by this section of these specifications. All costs in connection with furnishing and installation of the various items in accordance with standard practice, the details shown on the drawings and in accordance with these specifications shall be included in the Lump Sum Price of which the item is a part.

END OF SECTION

SECTION SP-8.3 – SUBMITTALS

Each submittal covered under SP-8 shall be thoroughly reviewed by the Contractor responsible for SP-8 work. The Contractor shall provide review comments attached to the submittal identifying compliance or non-compliance with the SP-8 specifications. The Contractor shall be responsible to verify that submittals meet specified requirements. Submittals shall be partitioned by specification section.

Submittal information for SP-8 submittals including but not limited to catalog cuts and other such formatted materials shall be assembled in a three-ring binder(s) for hardcopy submittals. All electronic submittals shall be submitted through DOW's PM Web System. Each SP-8 Section requiring a submittal shall be separated by section tabs or bookmarks. Multiple submittals for a single SP-8 Section is unacceptable. Hardcopy and electronic submittals shall contain a cover sheet, indexed by Sections. Sections shall contain an index sheet with equipment listed and cross-referenced to the appropriate specification paragraph.

Submittals shall be made for approval and resubmitted until approval is received for the following:

8.3.01 COPIES OF SP-8 SPECIFICATION SECTIONS:

A copy of all SP-8 specification sections, with addendum updates included, and all referenced and applicable sections, with addendum updates included, with each paragraph check-marked to indicate specification compliance or marked to indicate requested deviations from specification requirements. Check marks (✓) shall denote full compliance with a paragraph as a whole. If deviations from the specifications are indicated, and therefore requested by the Contractor, each deviation shall be underlined and denoted by a number in the margin to the right of the identified paragraph, referenced to a detailed written explanation of the reasons for requesting the deviation. The DOW shall be the final authority for determining acceptability of requested deviations. The remaining portions of the paragraph not underlined will signify compliance on the part of the Contractor with the specifications. Failure to include a copy of the marked-up specification sections, along with justification(s) for any requested deviations to the specification requirements, with the submittal shall be sufficient cause for rejection of the entire submittal with no further consideration.

8.3.02 CATALOG CUTS:

- A. Submit for approval one (1) hard copy and one (1) electronic copy of the catalog cuts of the following equipment:
- (1) Junction Boxes
 - (2) Pullboxes
 - (3) Conduits, including PVC coated GRS
 - (4) Conductors and Cables
 - (5) Panelboards
 - (6) Disconnect Switches
 - (7) Cabinets

- (8) Motor Control Center
- (9) Generator Connection Cabinet
- (10) Surge Protective Devices
- (11) Power Monitors
- (12) Reduced Voltage Solid State Starters (Soft Starters)
- (13) Power Factor Correction Capacitors, Capacitor Circuit Breakers, and Capacitor Contactors
- (14) Control Devices and Instrumentation
- (15) Light Fixtures and Lighting Control Devices
- (16) Metering Equipment
- (17) Any Built-to-Order Equipment

B. Catalog information for SP-8 submittals shall be manufacturer's catalog descriptive literature with identifying arrows pointing to the specific equipment, devices, and materials to be supplied for the individual specification sections. Catalog information shall include technical specifications and application information, including NEMA and electrical ratings, range, weight, accuracy, etc. Catalog cuts shall be edited to show only the items, model numbers, and information which apply.

8.3.03 EQUIPMENT AND MATERIAL SPECIFIC REQUIREMENTS:

A. RACEWAYS, BOXES, AND SUPPORTS:

- (1) Design details and materials for fire stopping.

B. PANELBOARDS:

- (1) Manufacturer's certification that bus bracing can withstand the specified short circuit condition.
- (2) Quantity and rating of circuit breakers provided with each panelboard.
- (3) Panel ratings, bus ampacities, schedule of branch breakers provided, and ground and neutral configuration.
- (4) Information required to support the short circuit and coordination and arc flash study specified in Section SP-8.8.

C. DRY-TYPE TRANSFORMERS (600 VOLTS AND LESS):

- (1) Information required to support the short circuit and coordination and arc flash study specified in Section SP-8.8.

D. MOTOR CONTROL CENTER:

- (1) Elementary connection and interconnection diagrams for each starter unit and an interconnection diagram for the entire MCC, in accordance with NFPA 79 and/or NEMA ICS 18 Part 1 standards.
- (2) Time current curves for all protection devices.
- (3) List of starters and feeder tap compartments indicating the size and type of circuit protection.
- (4) Interrupting, withstand, and continuous current rating of:
 - a. Bus bars
 - b. Feeder tap units
 - c. Starter units
 - d. Main incoming units
- (5) Soft starter wiring schematics complete with wire numbers
- (6) Manufacturer's certification and calculations that the equipment complies with the seismic requirements of Section SP-8.6.
- (7) Information required to support the short circuit and coordination and arc flash study specified in Section SP-8.8.
- (8) Results of factory tests as specified within this Section.
- (9) Nameplate schedule.
- (10) Dimensioned drawings showing conduit access locations.
- (11) Front view elevation with starter and component schedule.

8.3.04 SHOP DRAWINGS:

- A. Prior to fabrication, the Contractor shall submit for written approval of DOW one (1) hard copy and one (1) electronic set of complete material and installation drawings, control and connection wiring diagrams, installation details, internal and external layout drawings showing all components and dimensions, nameplate legend with engraving and sizes, and manufacturer's wiring diagrams for any built-to-order equipment and panels, including the MCCs and generator connection cabinet.

- B. Where the Contractor is required to provide information on drawings as part of the specified work, such drawings shall be prepared in AutoCAD 2011 format (.dwg) and shall be provided on DVDs or in electronic format and on 22 inches x 34 inches bond paper complete with borders and title blocks clearly identifying project name, equipment, and the scope of the drawing. Drawing quality and size of presentation shall be such as to permit 50 percent reduction (11 inches x 17 inches) of such drawings for insertion in operation and maintenance manuals. 11 inches x 17 inches size drawings may be provided in lieu of 22 inches x 34 inches if approved by DOW. Contractor shall provide hardcopy plots of all drawing files submitted.

8.3.05 ELECTRICAL INSTALLATION DRAWINGS: At least twenty (20) working days prior to any testing, the Contractor shall submit one (1) complete hard copy and one (1) electronic set of approved electrical installation drawings to DOW. The installation drawings shall include manufacturer's wiring diagrams for any built-to-order equipment.

8.3.06 PRE-TEST CHECKLIST:

- A. The following information shall be provided prior to commencing electrical and instrumentation equipment and functional testing:
 - (1) Proposed testing procedures including proposed test report forms and listing of equipment that will be tested.
 - (2) Test report including documentation for all tests performed. Utilize test forms referenced in Section SP-8.1.
 - (3) Execution plan including schedule.
 - (4) Name and qualifications of the independent testing firm that will be performing the testing work. Submitted information shall confirm that qualifications are to NETA ATS requirements.
- B. Prior to the startup or testing of the pumps, the Contractor shall submit a checklist of all field adjustable pump control devices. The list shall include but not be limited to the actual settings of all time delay relays and the solid-state starter ramp-up and ramp-down timing.

8.3.07 PRODUCT DATA:

The following information and product data specified under individual specification sections shall be provided once equipment and materials submitted have received favorable review dispositions:

- A. Applicable operation and maintenance information on an item-by-item basis. Operation and maintenance information shall be provided at the time of equipment, device, or material site delivery, or at a certain stage of project completion as required by DOW, whichever is earlier. Full-size drawings shall be reduced to 11 inches x 17 inches.
 - (1) All vendor supplied operations and maintenance manuals must be written in English.
 - (2) All vendor supplied operations and maintenance manuals must be submitted in an electronic file format on a Microsoft Windows compatible CD-ROM or DVD-ROM.

- (3) Three (3) identical hardcopies of each vendor-supplied operations and maintenance manual must be submitted.
 - (4) All submitted CD-ROMs or DVD-ROMs must have a professional quality label that includes, at a minimum, a descriptive title, the name of the vendor or supplier, and a date of creation.
 - (5) O&M information shall contain the names, addresses, and telephone numbers of the manufacturer, the nearest representative of the manufacturer, and the nearest supplier of the manufacturer's equipment and parts.
- B. Test results for motors and electrical systems on the forms specified in Section SP-8.1. A file of the original test results shall be maintained by the Contractor. Prior to acceptance of work, the resulting file shall be provided to DOW.
- C. Description of functional checkout procedures specified under Section SP-8.1, shall be provided 14 days prior to performing functional checkout tests.
- D. Record documents specified in Section SP-8.1.
- E. Equipment and Material Specific Requirements:
- (1) Grounding System: Ground resistance readings specified in Section SP-8.1.
 - (2) Dry-Type Transformers (600 Volts and Less)
 - a. Manufacturer's verification that the unit has been built and tested in accordance with the specified ANSI standards.
 - b. Manufacturer's verification of the sound levels, if different from the specified NEMA ST20 standards.
 - (3) Lighting Fixtures
 - a. IES lighting design files for use in lighting design software.
 - b. Manufacturers' warranties as specified in Section SP-8.10.
 - (4) Motor Control Center
 - a. Results of field tests as specified within Section SP-8.1.
 - b. Manufacturer's certification that the following items are capable of interrupting and/or withstanding the specified short circuit condition:
 - 1) Bus bar bracing
 - 2) Feeder tap units

3) Starter units

c. Dimensions and weights.

8.3.08 AS-BUILT DRAWINGS:

- A. Upon completion of the final inspection and testing, the Contractor shall provide one (1) hard copy and one (1) electronic set of as-built installation drawings and manufacturer's wiring diagrams for any built-to-order equipment to DOW.
- B. Record drawings shall be updated to include all field labelled terminal numbers and conductor tags to match actual equipment supplied and installed.

8.3.09 MEASUREMENT AND PAYMENT: No separate payments will be made for the work covered by this section of these specifications. All costs in connection with furnishing and installation of the various items in accordance with standard practice, the details shown on the drawings, and these specifications shall be included in the lump sum price of which the item is a part.

END OF SECTION

SECTION SP-8.4 – EXTERIOR WORK

Materials, equipment, and construction methods specified in other paragraphs of the specifications for Electrical Work shall apply to the exterior work.

8.4.01 EXTERIOR WIRING SYSTEMS:

A. The table below specifies the type of raceway required for each location and application.

Location	Application/Condition	RACESPEC
Outdoor	Exposed	GRS
Outdoor	Exposed transition from below grade or slab, minimum 6" above finish grade or slab	PRS
Concealed	Power and signal circuits embedded in concrete structure	PVC4
Underground	Power and signal circuits encased in concrete duct bank	PVC4
Outdoor	Exposed (only where specifically required to be PVC)	PVC8

B. **GALVANIZED RIGID STEEL CONDUITS (GRS):** Conduit shall be rigid steel, hot-dip galvanized after fabrication inside and out, round bore with smooth finished surfaces, ANSI and UL compliant. 3/4-inch minimum diameter unless otherwise specified. Conduit unions shall be made with threaded fittings; compression couplings are not acceptable. Prime and paint all new exposed conduits in accordance with manufacturer's instructions and SP-8.1. Acceptable manufacturers shall be Allied Tube and Conduit Corp., Wheatland Tube Co., or approved equal.

C. **POLYVINYL CHLORIDE (PVC) CONDUIT:** PVC conduit shall be round bore, smooth inside finish, electrical type. For normal duty, commercial grade Schedule 40 (PVC4) shall be provided. For installation in areas exposed to damage, or as specified above, commercial grade Schedule 80 PVC (PVC8) shall be provided. PVC conduit shall be NEMA TC2, UL 651 compliant. Fittings shall be PVC solvent weld type and joints shall be made with standard PVC couplings. Minimum size: 3/4-inch exposed; 1-inch embedded or encased.

PVC conduit entering fiberglass boxes or cabinets shall be secured by threaded bushings on the interior of the box and shall be terminated with a threaded male terminal adapter having a neoprene O ring.

All PVC conduit installed outdoors and exposed shall be painted gray in accordance with SP-8.1 for protection from sun exposure.

D. **PVC-COATED RIGID STEEL CONDUIT AND FITTINGS (PRS):** Conduit system, including fittings and mounting appurtenances, shall be hot dip galvanized inside and out with clear coated urethane over hot galvanized threads, with polyvinylchloride (PVC) jacket and red urethane interior coating. Conduit shall be round bore, smooth inside finish,

electrical type, and for use with approved threaded fittings. The PVC jacket shall be bonded to the galvanized steel and shall have a minimum thickness of 40 mils exterior coating and 20 mils interior coating. Robroy "Plasti-bond REDH20T" conduit system or approval equal, NEMA RN1.

- E. EXTERIOR UNDERGROUND CABLES AND WIRES: Exterior cables and wires shall be as specified in Section SP-8.5. Insulation and sheath conforming respectively to ASTM 0 1352-60 and ASTM 9 752-60. Splices shall be made with compression connector on the conductor and by insulating and waterproofing, suitable for continuous submersion in water and pass ANSI C119.1.

8.4.02 TRENCH EXCAVATION:

- A. Trench width and depths shall be sufficient to accommodate proper installation of boxes and ductlines. Excavate trenches along straight lines from structure to structure before ducts are laid or structure constructed so the elevation can be adjusted; if necessary, to avoid unseen obstructions.
- B. Where trench is excavated on slope, sides are to be vertical and depth measured at lowest side. All measurements are to be based on final grades.
- C. Bottom of trench shall be flat and smooth.
- D. Provide sheathing and bracing as required to support sides of excavations from cave-ins.
- E. Provide drainage and pumps as required to keep trenches dry.
- F. Saw cut all edges of existing sidewalks and pavement before trenching.
- G. Any existing underground piping or conduit that is encountered shall be properly shored and protected from damage. Any damage to existing utilities resulting from the Contractor's operations shall be repaired at the Contractor's expense.
- H. The contractor shall tone the entire route of any new trenching or excavation, and report any unforeseen obstructions to DOW. Damage to any existing underground utility or structure, as a result of the contractor's failure to tone, shall be the responsibility of the contractor, who will repair and restore any damages to the satisfaction of DOW, at no additional cost to DOW.

8.4.03 BACKFILL:

- A. Ducts and box installations shall be approved by respective utility company inspector prior to backfilling. All excavations for boxes in excess of the required depths shall be filled with crushed lava rock to the required depth.
- B. Backfilling shall be to finished grades and Contractor shall restore areas disturbed by operations to original condition to the satisfaction of DOW. Replace sod which has been removed, as soon as possible after backfilling is completed.
- C. Backfill material shall be provided in accordance with Section SP-9.

- D. Backfill material shall be placed in maximum of 8-inch layers in loose thickness before compacting. Backfill shall be thoroughly compacted with hand or mechanical tampers to 95 percent of ASTM D1557 maximum dry density. Jetting or flooding of backfill will NOT be permitted. In no case shall tamping be accomplished by using the wheels or tracks of a vehicle.

8.4.04 INSTALLATION OF CONDUIT AND DUCT BANK:

- A. Ducts shall be installed promptly after excavation in order to keep the trenches open as short a time as possible.

- (1) Saw cut, ream and taper ducts and conduits with manufacturers' approved tool.
- (2) Couplings and bells shall be tight to prevent entry of dirt or concrete into ducts and conduits. Stagger the joints of the ducts by rows and layers so as to provide a ductline having the maximum strength.
- (3) Provide spacers to maintain proper separation between ducts. Maintain minimum 1-foot separation between signal conduits and power/controls conduits.
- (4) Run conduits and duct banks in straight lines, except where change of directions are necessary, and conduits and duct banks shall have a continuous downward slope of three (3) inches in each 100 feet away from buildings and toward underground structures. Changes of direction shall not exceed 4 degrees per length of conduit or duct. Radii and turns shall be made with appropriate duct bends and sweeps.

Provide manufactured plastic conduit spacers anchored to prevent movement during the concrete pour. Manufacture: Carlon, PW Pipe, Underground Devices, or approved equal.

- (5) Underground conduit bend radius shall be not less than 2 feet minimum at vertical risers and shall be not less than 3 feet elsewhere.
- (6) Allow and provide for two offsets per conduit and raceway for each 100 linear feet to account for unexpected field conditions including for excavation and backfill limited to three feet of extra width and/or depth. Include these specified provisions in the bid price.
- (7) Terminate ducts in end-bells where ductlines enter manholes, handholes, walls, and boxes.
- (8) Apply thin coat of sealing compound on ducts and conduits at couplings and bells.
- (9) Securely anchor duct banks prior to pouring concrete encasement to prevent ducts from floating.
 - a. When pouring concrete, prevent heavy masses of concrete from falling directly on ducts. If unavoidable, protect ducts with plank.

- b. Direct flow of concrete down sides of duct bank to bottom, allowing concrete to rise between ducts, filling all open spaces uniformly.
 - c. To ensure against voids in concrete, work a long, flat spicing bar or spatula liberally and carefully up and down the vertical rows of ducts. Mechanical vibrators shall be used for stacked duct banks of three ducts or higher.
 - d. Cure concrete for a minimum of 72 hours before permitting traffic and/or backfilling.
- (10) Ducts shall be clean and free from debris and rubbish. After each day's work, provide temporary conduit plugs at the end of conduit banks to prevent entry of dirt, rubbish, debris, or concrete.
 - (11) After duct bank has been completed, unless indicated otherwise, pass a test mandrel through the entire length of each duct or conduit to test for burrs and obstructions and after which a brush with stiff bristles shall be pulled through to make certain that no particles of earth, sand or gravel have been left in the line. Mandrel shall be 14 inches long and shall have diameter of 1/2-inch less than inside diameter of duct. If burrs or obstructions are encountered, that section shall be replaced at no additional cost to DOW. Dewater any handhole prior to providing conductors.
 - (12) Unless indicated otherwise, pull cord shall be installed in each conduit. Pull cord is specified in this Section.
 - (13) Underground conduits and conduit banks shall maintain 2 feet earth cover unless otherwise shown. Earth cover for power duct banks that have feeders exceeding 400 amps capacity shall be installed with earth cover maintaining the 2 feet of cover throughout the length of the duct bank to the maximum extent physically possible. Where duct banks require more depth for lengths exceeding 10 feet, the situation shall be brought to the attention of DOW for review.
 - (14) Underground conduit banks through building walls shall be cast-in-place or installed with concrete into boxouts with water stops on all sides of the boxout. Water stops shall be as specified in the Cast-in-Place Concrete section. Extend the horizontal reinforcement from the duct bank into the boxout terminating with J-hook bends.
 - (15) Where reinforced concrete duct banks enter the side of a building, manhole, or handhole and the reinforcement cannot be brought into a window and be terminated, then drill the structure and embed the reinforcement in epoxy to minimum of 3 inches depth.
 - (16) Provide PVC threaded adapter with female threads where PVC conduit is joined to steel conduit. Procedure:
 - a. Before assembly: Double coat steel conduit with Red-Robroy, Green-Permacote, Blue-Ocal or approved equal.

- b. After assembly: Seal with 65-mil-thick, 2-inch-wide mastic sealing tape to 1/2-inch beyond threads. Products: 3M Scotch 2228; Plymouth 02625; or approved equal.
- c. Cover with 20-mil corrosion protection tape applied in 1/2-lap layers to 2-inch beyond threads. Products: 3M Scotchwrap 51; Plymouth Plywrap 12; or approved equal.

8.4.05 CONCRETE WORK: Ducts shall be completely encased in concrete. The encasement shall have minimum concrete thicknesses of 2 inches between conduits, 1-inch between conduit and reinforcing, and 3 inches between reinforcing and earth, unless shown otherwise in an electrical detail. Concrete may be increased to fit the actual shape of the trench. Concrete shall have a minimum 28-day compressive strength of 2,000 psi.

- A. Concrete, ready-mixed according to ASTM C94-98. Concrete aggregates for ductline shall be 3/4-inch maximum in size.
- B. Convey concrete from mixer to forms rapidly to prevent segregation. Free drop shall be limited to five (5) feet, unless authorized by DOW.
- C. PLACING:
 - (1) Clean and remove all debris from inside forms and trenches before placing concrete.
 - (2) Place concrete only on clean damp surfaces, free from water.
 - (3) Place concrete in forms, in horizontal layers NOT exceeding 18 inches thickness.
 - (4) Place concrete to avoid segregation of materials and displacement of ducts, inserts and reinforcing.
 - (5) Vibrate structural concrete thoroughly during and immediately after placing to ensure dense watertight concrete.
- D. FORMING:
 - (1) Forms shall be of good sound lumber with sufficient strength and conforming to shapes and dimensions required.
 - (2) Forms shall be treated with non-staining form oil immediately before each use.
 - (3) Form the concrete pour ten feet from the wall, manhole, or handhole and form to allow for future conduit entry.
- E. Patch all voids, pour joints and holes before concrete is thoroughly dry. Use mortar of same proportions as original concrete.
- F. Curing of concrete shall be accomplished by impervious membrane method with liquid membrane compound. Apply two (2) or more coats to obtain a total of one gallon for each 150 square feet of concrete surface.

G. REINFORCING STEEL:

- (1) Clean reinforcing steel of mill or rust scale and form to required dimensions.
- (2) Install reinforcing in proper locations and secure in place to prevent movement during concrete placing or vibrating.

H. Concrete encasement on exposed outdoor conduit risers shall continue to 3 inches above grade, with top crowned and edges chamfered.

8.4.06 UNDERGROUND MARKING TAPE

Underground detectable marking tape shall be for early warning protection of digging around direct buried cables, conduits, and concrete duct banks. Tape shall be OSHA approved.

Marking tape example: Low density polyethylene plastic, nominally 6 inches wide and 4 mil thickness with metallic lined tape with red polyethylene film on top and clear polyethylene film on the bottom. Tape shall be imprinted with a warning continuously along the length similar to: "CAUTION - STOP DIGGING - BURIED ELECTRIC LINE BELOW."

Tape Products: Brady "Identoline"; Services and Materials "Buried Underground Tape"; Somerset (Thomas & Betts) "Protect-A-Line"; or approved equal.

8.4.07 HANDHOLES AND PULLBOXES

A. Handholes and pullboxes shall be installed approximately where shown on the drawings. The exact location of each handhole or pullbox shall be determined after careful consideration has been given to the location of other utilities, grades, and pavement.

Handholes shall be precast concrete with checker plate, galvanized, traffic covers designed for H 20 loading. Handholes shall be provided with open bottoms. Handholes shall be constructed of 3000 psi reinforced concrete. Handhole cover shall be engraved "ELECTRICAL" or "SIGNAL" as applicable.

Dimensions shall be as specified on the drawings. Handhole walls shall be provided with raceway boxouts sized to accommodate the penetrating underground duct banks. Handholes shall be provided with angled riser sections to allow the handhole cover to be installed flush with finished grade.

Unless otherwise specified, handhole and pullbox installation shall be as follows:

- (1) Handholes and pullboxes shall be set on a minimum of 12 inches of crushed rock on top of undisturbed or compacted earth.
- (2) Handholes shall be set plumb so that water shall drain to the sump. Where installed in roadways, handhole lids shall be set to match grade of roadway. Use of slope riser section for the handholes may be required.
- (3) Metallic hardware inside handholes shall be bonded to the ground plate or ground bus using bolted connections, bonding jumpers and grounding bushings.

B. IDENTIFICATION TAGS:

Each set of cables #6 AWG and larger in handholes and pullboxes shall be identified by a non-corrosive metal tag. Letters shall be minimum 1/4-inch high identifying the cable as to use and voltage. Tags shall be wrapped around the cables and taped. Power tags shall be red.

For cables smaller than #6 AWG, provide Wire Markers as specified in Section SP-8.1.

C. CABLE SUPPORTS:

Provide heavy-duty, non-metal cable racks for support of conductors. Racks shall be UL listed glass-reinforced nylon consisting of slotted wall brackets for support arms designed for a minimum of a 400-pound load. Each support bracket shall from the top to the bottom and the arms shall be adjustable and installed on 24-inch centers. Use 1/2-inch stainless steel bolts, hardware, inserts, and fasteners. Cables supports, clamps or racks shall be provided to support the cable at minimum 2-foot intervals. Concrete inserts shall be embedded on 24-inch centers in walls and ceiling.

Cable Support Products or approved equal:

- (1) Underground Devices Incorporated Type RA arms with CR36 support brackets.
- (2) Unistrut Power-Rack F20N-STA33 Stanchions with F20N-ARM14 Arms.

8.4.08 GROUND BUS: Provide a ground bus in concrete manholes, handholes, and electrical pullboxes with dimension of 3-foot width x 3-foot length x 3-foot depth and larger. Provide a NEMA threaded 4-hole grounding plate for connecting two to four 1-hole ground connectors that enter the enclosure from two to four duct banks. Products: Burndy, T&B, or approved equal.

8.4.09 CONNECTIONS TO EXISTING CONCRETE PADS: Where connections to existing concrete pads are indicated, break an opening in the pad out to the dimensions required and preserve steel in pad. Cut the steel and bend out to tie into the reinforcing of the duct line envelope. Chip out the opening in the pad to form a key for the duct bank envelope.

8.4.10 CABLES: Cables shall be thoroughly lubricated with soapstone before drawn into ducts.

8.4.11 ELECTRICAL SEALANT: Electrical sealant putty shall be non-hardening, non-oxidizing, non-corrosive, non-poisonous, and non-injurious to human skin with service temperature range of 30 to 200 degrees Fahrenheit. Product shall be used to seal against the entrance of water.

8.4.12 PULLING LINE: Pulling line shall be polyethylene type, mildew and rot resistant with minimum of 200-pound tensile strength and minimum 1/4-inch diameter. Install in all "future" raceways. Manufacture: Greenlee, Ideal, or approved equal.

8.4.13 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-8.5 – DEVICES AND EQUIPMENT

All devices, materials, and equipment specified herein shall be manufactured and installed in accordance with the appropriate articles in the (National Electrical Code) NEC except as noted. Equipment and materials shall be new and free from defects. All materials and equipment of the same or a similar type shall be of the same manufacturer throughout the work. Standard production materials shall be used wherever possible.

8.5.01 WIRING MATERIALS

A. The table below specifies the type of raceway required for each location and application.

Location	Application/Condition	RACESPEC
Indoor noncorrosive	Exposed	GRS
Indoor corrosive	Exposed	PVC8
Nonhazardous	Final connection to equipment and light fixtures	LFS
Architecturally finished areas	Concealed in framed walls and ceiling spaces (lighting and receptacle circuits only)	EMT
Architecturally finished areas	Final connection to light fixtures	FLEX

B. GALVANIZED RIGID STEEL CONDUITS (GRS):

Conduit shall be rigid steel, hot-dip galvanized after fabrication inside and out, round bore with smooth finished surfaces, ANSI and UL compliant. 3/4-inch minimum diameter unless otherwise specified. Conduit unions shall be made with threaded fittings; compression couplings are not acceptable. Prime and paint all new exposed conduits. Acceptable manufacturers shall be Allied Tube and Conduit Corp., Wheatland Tube Co., or approved equal.

(1) Unscheduled Raceway:

With the exception of lighting, telephone, and receptacle circuits, the type and size of raceway shall be as specified in the table above or on the Drawings.

Unscheduled lighting and receptacle raceways shall be sized by the Contractor in accordance with the NEC. Minimum size shall be 3/4-inch for exposed and 1-inch for embedded raceway.

C. The number and size of communication raceways shall be as required for the particular equipment provided subject to the minimum sizes specified herein. POLYVINYL CHLORIDE (PVC) CONDUIT:

PVC conduit shall be round bore, smooth inside finish, electrical type. For normal duty, commercial grade Schedule 40 (PVC4) shall be provided. For installation in areas exposed to damage, or as specified above, commercial grade Schedule 80 PVC (PVC8) shall be provided. PVC conduit shall be NEMA TC2, UL 651 compliant. Fittings shall be PVC

solvent weld type and joints shall be made with standard PVC couplings. Minimum size: 3/4-inch exposed; 1-inch embedded or encased.

PVC conduit entering fiberglass boxes or cabinets shall be secured by threaded bushings on the interior of the box and shall be terminated with a threaded male terminal adapter having a neoprene O ring.

D. LIQUIDTIGHT FLEXIBLE CONDUITS (LFS):

Conduit shall be liquidtight flexible steel constructed from spiral-wound steel strip with successive convolutions securely interlocked and jacketed with liquidtight plastic cover, UL 360 compliant. Minimum size shall be 3/4-inch unless otherwise specified. For use with threaded fittings. Provide O-ring seals at conduit and box connections. Provide forty-five and ninety-degree fittings where applicable. Prime and paint all new exposed conduits. Length of flexible liquidtight conduit shall not exceed 15 times the trade diameter of the conduit and not exceed 36 inches in length. Use conductive thread compound. Acceptable manufacturers shall be Sealtite by Anamet Electrical, Inc. or approved equal.

E. ELECTRICAL METALLIC TUBING (EMT):

Conduit shall be electrical metallic tubing with electro-galvanized steel finish, ANSI and UL compliant. Minimum size shall be 3/4-inch unless otherwise specified. For use with compression type fittings. Provide electro-galvanized sheet steel boxes where necessary, NEMA 1 stamped or form-bent with screw covers.

F. FLEXIBLE CONDUITS (FLEX):

Conduit shall be flexible steel constructed from spiral-wound galvanized steel strip with successive convolutions securely interlocked, UL 1 compliant. Minimum size shall be 3/4-inch unless otherwise specified. For use with compression type fittings and EMT type conduit. Provide with an internal ground wire. Provide forty-five and ninety-degree fittings where applicable. Prime and paint all new exposed conduits. Length of flexible liquidtight conduit shall not exceed 15 times the trade diameter of the conduit and not exceed 36 inches in length.

G. ENCLOSURES AND CABINETS:

Enclosures and cabinets for panelboards, breakers, and switches shall be National Electrical Manufacturers Association (NEMA) type, fabricated from galvanized steel, prime painted and enamel finished according to NEMA specifications. Special purpose cabinets shall be formed without knockouts.

H. BOXES, GUTTERS, AND TERMINAL CABINETS:

(1) General: Provide Type 316L (low carbon) or Type 316 stainless products where stainless steel is specified. Enclosure constructed of mild sheet steel shall be hot-dipped galvanized after fabrication. Hinges shall be continuous type and for NEMA 4X cabinet hinges shall be stainless steel. Boxes or enclosures installed outdoors shall be provided with breather/drain fittings constructed of Type 316 stainless steel and with a NEMA rating matching the rating of the box or enclosure.

The table below specifies the electrical enclosure material and rating for the location and application.

Location	Electrical Enclosure Material and NEMA Rating
Indoor: Control Building	NEMA 1, Mild Steel
Outdoor: All Areas	NEMA 4X, Stainless Steel (Type 316)

(2) Pullboxes and Wire Gutters:

Indoor boxes and enclosures in non-corrosive or non-process areas larger than FD boxes shall be constructed of sheet steel and galvanized after fabrication. Outdoor boxes and enclosures shall be provided with neoprene gaskets on the hinged doors or removable covers. Box and gutter sizes, metal thickness, and grounding shall comply with the National Electrical Code. Bolt-on junction box covers 3 feet square or larger, or heavier than 25 pounds, shall have a rigid handle. Covers larger than 3 x 4 feet shall be split.

(3) Terminal Cabinets:

Terminal cabinets shall be provided with adjustable terminal strip mounting, back-panels for equipment mounting, print pockets in the doors, continuous door hinges, and three-point lockable latches. Terminal cabinets located outdoors and in corrosive areas shall be with stainless steel door hinge, three-point latch, and filtered ventilation, if required. Terminal blocks shall conform to Section SP-8.1.

I. OUTLET AND SMALL JUNCTION BOXES:

Concealed boxes shall be pressed from NEC code gauge steel, galvanized 4-inch square x 1-1/2-inch deep minimum or as specified on drawings.

- (1) Unless indicated otherwise, exposed boxes and weather exposed recessed boxes shall be cast aluminum, prime painted, enamel finished, threaded hubs for conduit connection.
- (2) Extension or raised rings for pressed boxes pressed from NEC code gauge steel and galvanized. Use as required at device outlets and make box opening flush with finished surface.

J. WIRES AND CABLES:

(1) Scheduled Conductors and Cables:

Where conductors and cables are identified on the drawings, they shall be provided in accordance with the table below:

Cable/ Raceway Identifier	Description	Cable Type	Special Provisions Section
P	Power	XHHW-2	8.5.01 J (4)
C	Control	XHHW-2	8.5.01 J (4)
S	Signal	#16 twisted shielded pair	8.5.01 J (5)
D	Data (Ethernet)	CAT-6	8.5.01 J (6)

(2) **Unscheduled Conductors and Cables:**

Where not specified on the Drawings, conductors and cables shall be sized in accordance with the National Electrical Code for the particular equipment served with the minimum size as specified herein.

Unscheduled conductor with insulation shall be type XHHW-2, as specified in Power and Control Conductors and Cable, 600 Volt, SP-8.5.01 J (4), below.

(3) **Color Coding:**

a. **Control Conductors:**

Single-conductor control conductors shall have the following colors for the indicated voltage:

Control Conductor	120V
Control (AC)	Red
Neutral	White
Ground	Green
Power (DC)	Blue
Control (DC)	Violet

b. **Power Conductors:**

Power conductors shall have the following colors for the indicated voltage:

Power Conductor	480V	208/120V
Phase A	Brown	Black
Phase B	Orange	Red
Phase C	Yellow	Blue
Ground	Green	Green
Neutral	Gray	White

Cables may be black with colored 3/4-inch vinyl plastic tape applied at each cable termination. Tape shall be wrapped with 25 percent overlay to provide 3 inches minimum coverage.

c. **Signal Conductors:**

Signal cable conductors shall be color coded black and white for pairs or black, white, and red for triads. Each conductor and each group of conductors shall be numbered.

(4) Power and Control Conductors and Cable, 600 Volt:

Cables shall be copper conductor, insulation type XHHW-2. Conductors shall be 600V rated, 90-degrees C, cross-linked polyethylene in accordance with ICEA S-66-524. Minimum size shall be #12 AWG for power, control, and lighting circuits.

Conductors shall be bare annealed copper; stranded in accordance with ASTM B8. Acceptable products shall be Okonite X-Olene, Southwire, or approved equal.

(5) Signal Cables:

Factory cable between manufactured instrument system components shall be provided in compliance with the instrument manufacturer's recommendations.

Signal cable shall be provided for instrument signal transmission. Single instrument cable shall be single twisted, shielded pairs, 16 AWG, with overall shield instrumentation cable. UL listed, Cable Tray and 600V rated. Bare annealed copper; Class-B stranded per ASTM B-8.

Insulation shall be 15 mil, Flame-retardant Okoseal (PVC) with 4 mil nylon, 75-degree C temperature rated, UL 1277. Color Code per ICEA Method-1: Pairs- Black and White. Twisted on a 2-inch lay.

Shield shall be 100 percent, 1.35 mil aluminum/polyester or Mylar tape with 7-strand tinned copper drain wire. Overall shield shall be 2.35 mil aluminum-Mylar tape with 7-strand tinned copper drain wire. Jacket shall be flame-retardant, moisture and sunlight resistant 45 mil Polyvinyl Chloride (PVC).

Acceptable products shall be Okonite, Okoseal-N type SP-OS (Shielded Pairs with Overall Shield); Cooper Industries-Belden; General Cable; or approved equal.

(6) Data Communication Cable:

Data Communication cable shall be Category 6 (250MHz); Fast Ethernet 100Base-T; 4-pair, F/UTP-Foil Shielded, 22AWG solid bare copper conductors, FEP insulation, polyester separator, overall foil shield and low smoke polyvinyl chloride outer jacket, Belden or approved equal.

K. SPLICING AND TERMINATING MATERIALS:

Connectors shall be tool applied compression type of correct size and UL listed for the specific application. Connectors shall be tin-plated high conductivity copper. Wire nuts for a splice are prohibited.

Signal and control conductors shall be connected to terminal blocks and field devices and instruments shall be terminated with conductor terminals as specified in Section SP-8.1.

Connectors for wire sizes No. 8 AWG and larger shall be compression tool installed one-hole lugs up to size No. 3/0 AWG, and two-hole or four-hole lugs for size No. 4/0 and larger. Mechanical clamp, dimple, screw-type connectors are not acceptable. In-line splices and taps shall be used only by written consent of DOW or where specifically allowed in these Specifications or on the Drawings.

Power conductor splices shall be compression type, made with a compression tool die approved for the purpose, as made by Thomas and Betts Corp., or approved equal. Splices shall be covered with electrical products designed for the application, insulated, and covered with a heat-shrinkable sleeve or boot, as specified elsewhere.

Motor connection kits shall consist of heat-shrinkable, polymeric insulating material over the connection area and high dielectric strength mastic to seal the ends against ingress of moisture and contamination. Motor connections may use the Tyco Electronics removable boot product line.

Motor connection kits shall accommodate a range of cable sizes for both in-line and stub-type configurations. Connection kits shall be independent of cable manufacturer's tolerances.

L. RACEWAY SUPPORTS:

(1) Conduit Supports:

Framing channel with end caps and straps shall be provided to support groups of conduit. Individual conduit supports shall be one-hole pipe straps used with clamp backs and nesting backs where required. Material shall be Type 316 stainless steel.

Conduit supports for PVC coated rigid steel and PVC conduit systems shall be one-hole PVC coated rigid steel clamps or oversized Type 316 stainless steel clamps.

(2) Ceiling Hangers:

Ceiling hangers shall be adjustable steel rod hangers and fittings. Provide J-Type conduit support for single conduit. Straps or hangers of plumber's perforated tape are not acceptable. Unless otherwise shown, hanger rods shall meet ASTM A193 and be sized as 3/8-inch up to 2-inch conduit and shall be 1/2-inch all-thread rod over 2-inch conduit. Material shall be Type 316 stainless steel.

(3) Suspended Raceway Supports and Racks:

Suspended raceway supports shall consist of concrete inserts, steel rod hangers, and jamb nuts supporting framing channel or lay-in pipe hangers as required. Framing channel shall be a minimum of 12-gauge. Material shall be Type 316 stainless steel.

Hanger rods shall be 1/2-inch-diameter all-thread rod and shall meet ASTM A193.

(4) Materials:

The table below specifies the type of raceway supports required for each location and application.

Location	Framing channel	Threaded rod, hardware, and fittings
Indoor, Control Building	Steel, HDG	Steel, HDG
Outdoor, corrosive area (general)	Stainless Steel (Type 316)	Stainless Steel (Type 316)

HDG = Hot Dip Galvanized Finish

M. FIRESTOPS:

Firestops and seals shall be Flamemastic 77, Vimasco No. 1-A, or approved equal, and shall be applied in accordance with manufacturer's recommendations. Products which are affected by water are not acceptable. Use with manufacturer recommended fire stop pillows and putties.

N. CONDUIT THREAD LUBRICANT:

Thread lubricant shall be conductive with anti-seize and anti-corrosion properties, compatible with steel and aluminum conduit materials. Manufacture: T&B Kopr-Shield; Crouse Hinds STL; or approved equal.

8.5.02 WIRING DEVICES

A. GENERAL:

Wiring devices shall be UL approved for the current and voltage specified and shall comply with NEMA WD 1. Devices shall contain provisions for back wiring and side wiring with captive binding screws.

Provide devices colored to conform to manufacturer's or industry standard for special use such as orange for isolated ground receptacles, blue for surge suppression receptacles, and red for emergency power receptacles. Unless shown otherwise on the Drawings, normal use devices shall be brown, except those located in finished areas shall be ivory.

B. RECEPTACLES AND PLUGS:

(1) General:

Receptacles shall be grounding type.

(2) 120V Receptacles:

- a. INDOOR, CLEAN AREAS: Unless shown otherwise on the Drawings or Schedules, receptacles shall be duplex 20 amp, NEMA 5-20R, and shall accept NEMA 5-15P and 5-20P plugs. Where the manufacturer of cord-connected equipment requires an isolated ground, a receptacle with isolated ground shall be provided.

Manufacturers: Hubbell 5362, General Electric 4108-2, or approved equal.

Isolated ground receptacle manufacturers: Hubbell IG-5362, Arrow-Hart IG5362, or approved equal.

- b. OUTDOOR, PROCESS OR CORROSIVE AREAS: Receptacle shall be duplex, 20 ampere, NEMA 5-20R, and shall accept NEMA 5-15P and 5-20P plugs. Receptacle and plug shall be corrosion resistant, marine duty with clear polycarbonate cover, weatherproof-while-in-use type.

For outdoor locations or locations near bathrooms, sinks, or other sources of water, receptacles shall be GFCI type.

Manufacturers: Hubbell 53CM62/53CM21, General Electric, or approved equal.

(3) 250V Receptacles:

Receptacles shall be duplex 15 amp, NEMA 6-15R, and shall accept NEMA 6-15P plug caps. Receptacles shall be Hubbell 5662, Arrow Hart 5662, or approved equal. Plug caps shall be Hubbell 5666-C, Arrow-Hart 6866, or approved equal.

C. SWITCHES:

(1) General Purpose (INDOOR, CLEAN AREAS):

General purpose switches shall be quiet AC type, specification grade, back and side wired, and shall be provided in accordance with rated capacities as required or as indicated on Drawings. Switches used for motor control shall be horsepower rated a minimum of 1/2 HP at 15 amps and 1 HP at 20 amps. Switches shall match receptacles in color.

Manufacturers: General Electric, Hubbell, or approved equal, as follows:

	15A, 120-277V		20A, 120-277V	
	G.E. Co.	Hubbell	G.E. Co.	Hubbell
Single:	GE5931	HBL1201	GE5951	HBL1221
Three-way:	GE5933	HBL1203	GE5953	HBL1223
Four-way:	GE5934	HBL1204	GE5954	HBL1224
SPST momentary:	GE5953	--	--	--
Three-position center-off momentary:	GE5935	HBL1556	--	HBL1557

(2) Switches for Outdoor and Corrosive Areas:

Switches shall be 20-ampere presswitch type with weatherproof/ corrosion resistant neoprene plate. Switches shall be mounted in "FS" type copper-free aluminum or PVC mounting boxes.

Manufacturers: Hubbell or Arrow-Hart as follows:

	Hubbell with 17CM50 plate	Arrow-Hart with 2881 plate
Single pole	1281	2991
Double pole	1282	2992
3-way	1283	2993
4-way	1284	2994

D. DEVICE PLATES:

Device plates shall be provided with switches. In non-corrosive indoor areas, receptacle device plates shall be satin finished Type 302 high nickel stainless steel, 18% chrome, 8% nickel with suitable holes for device as manufactured by Crouse-Hinds, Appleton, or approved equal.

Device plates in corrosive or outdoor areas shall be corrosion-resistant/marine-duty type. Device plates for explosion-proof equipment shall be factory provided with the equipment.

Device plates for UPS powered receptacles shall be red.

Device plates shall be provided with engraved laminated phenolic nameplates with 1/8-inch white characters on black background.

Nameplates for switches shall identify panel and circuit number and area served. Nameplates for receptacles shall identify circuit and voltage if other than 120 volts, single phase.

E. CABLE STRAIN RELIEF:

Cable strain relief devices shall be provided where a cable leaves a disconnect box to a field mounted mixer. The strain-relief device shall be a stainless steel wire grip with a 45-degree insulated-throat box connector. The wire grip shall be as manufactured by HUBBLE/ KELLUMS, or approved equal.

F. HARDWARE, SUPPORTS, BACKINGS, ETC.:

All hardware, supports, backings, and other equipment shall be provided. Wood materials, for use in dry locations only, shall be "wolmanized" treated against termite; ferrous materials for use in dry locations only shall be galvanized for corrosion protection; ferrous materials for use in damp or wet locations shall be Type 316 stainless steel; and nonferrous materials shall be brass or bronze.

8.5.03 PROTECTIVE EQUIPMENT:

A. PANELBOARDS:

(1) Panelboard Types:

- a. Three-phase, four-wire 208Y/120 or 480Y/277 volt, dead front, circuit breaker type panelboard with current rating of 600-amperes or less.

- b. Single-phase, three-wire 120/240 volt, dead front, circuit breaker type panelboards with current rating of 400-amperes or less.

(2) Manufacturers:

DOW believes the following candidate manufacturers are capable of producing equipment and/or products that will satisfy the requirements of this Section. This statement, however, shall not be construed as an endorsement of a particular manufacturer's products, nor shall it be construed that named manufacturers' standard equipment or products will comply with the requirements of this Section. Candidate manufacturers include:

- a. EATON / CUTLER-HAMMER:

PRL1a and PRL3a Clipper Power Visor Surge Protective Device series.

- b. GENERAL ELECTRIC:

AQ and AD with internal Surge Protective Devices.

- c. SIEMENS:

S1, SE, and S3 with internal Surge Protective Devices

- d. SQUARE D:

NQOD and NF with internal Surge Protective Devices.

- e. Or approved equal.

(3) Arrangement and Construction:

Assembly mounted in MCC. Manufacture and install according to NEC Articles 240 and 408.

The front of the panel shall have concealed trim clamps and hinges. The locks shall be flush with cylinder tumbler-type with spring loaded door pulls. The fronts shall not be removable with doors in the locked position. Panelboard locks shall be keyed alike.

Gutter space shall be provided on all sides of the breaker assembly to neatly connect and arrange incoming wiring.

Panelboard shall be composed of individually mounted circuit breakers designed to be removable without disturbing other breakers.

A directory holder with clear plastic plate and metal frame shall be mounted on the inside of the door.

Panelboard shall come complete with breaker locking mechanisms to facilitate lockout tagout procedures, for all breakers supplied.

(4) Bus:

Bus shall be tin-plated copper and shall have current ratings as shown on the panelboard schedules, sized in accordance with UL 67. Ratings shall be determined by temperature rise test.

The minimum bus size shall be 100 amperes. Panel fault withstand rating shall be not less than the interrupting rating of the lowest-rated circuit breaker in the panel and shall be verified with the results of the short circuit study specified in SP-8.7. Series rating is prohibited.

Panelboards shall be provided with a separate ground bus and, where specified, with a full capacity neutral bus. The neutral bus shall be mounted on insulated stand-offs.

(5) Circuit Breakers:

Circuit breakers shall be molded-case type provided for the current ratings and pole configurations specified on the panelboard schedule. Circuit breakers shall be bolt-on type. Circuit breakers shall be listed in accordance with UL 489 for the service specified. Load terminals of circuit breakers shall be solderless connectors.

Circuit breakers rated 120/208 volt alternating current shall have an interrupting current rating sized according to the results of DOW approved short circuit calculations and protective device coordination study required by SP-8.8, with a minimum of 18,000 amperes symmetrical at 208 volt AC.

Circuit breakers rated 277/480 volt alternating current shall have an interrupting current rating sized according to the results of DOW approved short circuit calculations and protective device coordination study required by SP-8.8, with a minimum of 65,000 amperes symmetrical at 480 volt or as specified on the panelboard schedule.

Provide circuit breakers with special features such as ground fault interrupting (GFI), heating air conditioning and refrigeration (HACR) rating, or locking capability as shown on the Drawings or Schedules.

(6) Finish:

Panelboard cabinet shall be fabricated from hot-dip galvanized steel in accordance with UL 50. Panelboard fronts shall have a gray, baked enamel finish.

(7) Surge Protective Device (SPD):

Provide a metal oxide varistor (MOV) surge protective device (SPD) integral within each panelboard where indicated on the drawings that indicates the status and condition of the SPD. Each SPD shall be bus connected for parallel operation, rated for 208Y/120V, 3-phase, 4-wire systems; and 240/120V, 1-phase, 3-wire systems; and have a minimum surge rating of 120kA per phase. The SPD shall be designed, manufactured and tested in accordance with the latest applicable UL Listed standards (UL 1449, 3rd Edition), UL 1283 and CSA certified per CSA 22.2. Each SPD shall have an audible alarm with silence switch, an alarm indicator light, and indicator lights

for line-to- neutral, line-to-ground, and neutral-to-ground monitoring. Ground per NEC and manufacturer's instructions.

(8) Schedules:

Panelboard schedules are shown on the Drawings.

B. INDIVIDUAL CIRCUIT BREAKERS:

Circuit breakers shall be thermal magnetic, molded case type with the ampere rating as specified. Circuit breaker interrupting rating shall be sized according to the results of DOW approved short circuit calculations and protective device coordination study required by SP-7.8, with a minimum of 65,000 amperes symmetrical at 480 volt.

C. SAFETY DISCONNECT SWITCH:

Safety disconnect switches shall be heavy-duty, 30-400 ampere rating, fused or non-fused, as indicated on the drawings, stainless steel operator, safety type rated 600 volts AC.

Provide fusible disconnect switches with ratings as indicated on the drawings. Provide 200kAIC Class R or Class J current limiting fuses as appropriate for the circuit type and the circuit voltage. Provide built-in fuse-pullers.

Enclosures shall be:

- (1) NEMA 1 for architecturally finished areas and electrical room.
- (2) NEMA 4X Type 316 stainless steel for all other areas.

The operating handle shall be capable of being padlocked in the "off" position. The operator shall be a positive, quick-make, quick-break mechanism. Provide bolt-on hubs. Provide door lock. Provide nameplates with the equipment tag number, equipment description, and power source as indicated on the drawings. Submit nameplate list.

Switches shall be horsepower rated for motors and shall comply with NEMA KS 1. Switches shall be provided with defeatable door interlocks that prevent the door from opening when the operating handle is in the "on" position. Switches shall have line terminal shields.

Manufacturer: Eaton, Square-D, Siemens, General Electric, ABB, or approved equal.

D. NAMEPLATES: Nameplates shall be provided in accordance with the requirements of Section SP-8.1.

8.5.04 CONTROL DEVICES:

A. PUSHBUTTONS:

Pushbuttons shall be flush head, heavy-duty, with NEMA rating to match enclosure type. Operators shall be green for start function, red for stop functions, and black for all other functions. The escutcheon legend shall be as specified on the drawings.

- (1) UL Listed.
- (2) Dielectric Strength: 1300 Volts for one minute for Logic Reed contacts, 2200 Volts for one minute for other contacts.
- (3) 1.2-inch (30.5-mm) mounting hole.
- (4) Temperature operating range 14-degree F (-10-degree C) to 131-degree F (55-degree C).
- (5) Momentary contact type
- (6) When switching circuits are monitored by programmable controllers or other solid-state circuits, furnish hermetically-sealed, logic-reed type contacts rated not less than 0.15 amperes at 150 Vac and 0.06 amperes at 30 Vdc.
- (7) When switching circuits are not monitored by programmable controllers or other solid-state circuits, furnish contacts with NEMA Utilization Category rating A600 rated not less than 10 amperes continuous and 6 amperes break at 120 Vac.

Manufacturer: Allen-Bradley 800T/800H series or approved equal.

B. SELECTOR SWITCHES:

Selector switches shall be heavy-duty with NEMA rating to match enclosure type. Selector switches shall have maintained position contacts. Switches shall be provided with contact blocks and number of positions as required performing the specified or indicated operations.

The escutcheon legend shall be as specified on the drawings. Provide:

- (1) UL Listed.
- (2) Dielectric Strength: 1300 Volts for one minute for Logic Reed contacts, 2200 Volts for one minute for other contacts.
- (3) 1.2-inch (30.5-mm) mounting hole.
- (4) Temperature operating range 14-degree F (-10-degree C) to 131-degree F (55-degree C).
- (5) Standard knob operator (not lever type nor wing lever type)
- (6) Number of positions and contact configuration as shown on Drawings.

- (7) When switching circuits are monitored by programmable controllers or other solid-state circuits, furnish hermetically-sealed, logic-reed type contacts rated not less than 0.15 amperes at 150 Vac and 0.06 amperes at 30 Vdc.
- (8) When switching circuits are not monitored by programmable controllers or other solid-state circuits, furnish contacts with NEMA Utilization Category rating A600 rated not less than 10 amperes continuous and 6 amperes break at 120 Vac.

Manufacturer: Allen-Bradley 800T/800H series or approved equal.

Where shown on the instrumentation drawings field instruments and field analyzers shall have a lock-out style selector switch for locking on or locking off the 120Vac power source. The selector switch shall use a control station in NEMA-12, 4, 4X, or 7 as required by the area classification. Provide O-Z/Gedney Class 441 with two position key-operated maintained contact switch.

C. INDICATING LIGHTS:

Red, amber, green, and blue indicating lights shall be heavy-duty full voltage 120Vac or 24Vdc push-to-test LED type with NEMA rating to match enclosure type for installation in a 1.2-inch (30.5-mm) hole. Furnish with 28 chip high visibility LED. The escutcheon and lens color shall be as shown on Drawings or scheduled.

White indicating lights shall be as above, incandescent type lamp.

Manufacturer:

- (1) Allen-Bradley 800H-QRTH10 series or approved equal for 120Vac applications with colors other than white.
- (2) Allen-Bradley 800H-QRTH24 series or approved equal for 24Vdc applications with colors other than white.
- (3) Allen-Bradley 800H-QRT10 series or approved equal for 120Vac applications with white.
- (4) Allen-Bradley 800H-QRT24 series or approved equal for 24Vdc applications with white.

Refer to Section SP-8.1 for indicating light lens colors.

D. CONTROL STATION ENCLOSURES:

- (1) Enclosures locations and ratings:
 - a. Indoors: NEMA 12
 - b. Outdoors and Corrosive areas: NEMA 4X Type 316 stainless steel

E. CONTROL POWER TRANSFORMERS:

- (1) Sized for the panel devices and products.
- (2) Dual primary and single secondary fusing.

F. NAMEPLATES: Nameplates shall be provided in accordance with the requirements of Section SP-8.1.

8.5.05 CONTROL RELAYS

A. LOAD-SWITCHING CONTROL RELAYS:

Control relays used for switching loads such as solenoids, actuators, contactors, motor starter coils, remote interlocking, etc. shall be NEMA heavy-duty industrial type.

Contacts shall be 4-pole and be field interchangeable to either normally-open or normally-closed. Relay shall be capable of accepting a 4-pole adder.

AC relays shall have NEMA A600 contact ratings and electrical clearances for 600 volts. DC relays shall have NEMA P300 contact ratings and electrical clearances for 250 volts.

Manufacturer: Allen Bradley Bulletin-700, Square D Class 8501, or approved equal.

B. LOGIC LEVEL SWITCHING CONTROL RELAYS:

Control relays for signal circuits shall be IEC industrial rated with 4-poles minimum that can be field interchangeable to either normally-open or normally-closed.

Manufacturer: Allen Bradley Bulletin-700-CF Series, or approved equal.

C. TIMERS:

(1) Multi-function, micro-controller based, socket mounted timing relay.

(2) Single functions:

- a. Delay on Make
- b. Delay on Break
- c. Recycle (on time first, equal recycle delays)
- d. Single shot
- e. Interval
- f. Trailing edge single shot
- g. Inverted single shot

- h. Inverted delay on break
- i. Accumulative delay on make
- j. Re-triggerable single shot

(3) Dual functions:

- a. Delay on make/delay on break
- b. Delay on make/recycle (on time first, equal recycle delays.)
- c. Delay on make/interval
- d. Delay on make/single shot
- e. Interval/recycle (on time first, equal recycle delays)
- f. Delay on break/recycle (on time first, equal recycle delays)
- g. Single shot/recycle (on time first, equal recycle delays)
- h. Recycle – both times adjustable (on time first)
- i. Recycle – both times adjustable (off time first)
- j. Interval/delay on make
- k. Accumulative delay on make/interval

(4) Time delay range, switch selectable:

- a. Single function 0.1 second to 1,705 hours in 8 ranges.
- b. Dual function 0.1 second to 3,100 minutes in 8 ranges.
- c. Setting accuracy +/- 1 percent or 50 milliseconds, whichever is greater.
- d. Repeat accuracy +/- 0.1 percent or 16 milliseconds, whichever is greater.

(5) Output:

- a. Two Form-C electromechanical isolated contacts rated 10-amperes resistive at 240Vac
- b. Rated 1/3-horsepower at 120 or 240Vac
- c. Double-pole double-throw: DPDT.
- d. Mechanical life: 10,000,000 operations

e. Electrical life: 1,000,000 operations at full load.

(6) Mounting: Magnal Plug 11-pin socket.

(7) Environment: -4-degree F (-20-degree C) to 149-degree F (65-degree C).

(8) Manufacturer: ABB / SSAC's multifunction type TRDU time delay relay with dip-switch function setting with 12Vdc, 24Vac, 120Vac, 240Vac inputs as required or indicated or approved equal.

D. ALTERNATING RELAY:

(1) Alternate assignment between "Duty" and "Stand-by" at the end of each run cycle.

(2) Double-pole, double-throw output relay rated for 7-amps inductive at 120-volts AC.

Isolation not less than 1,500-volt RMS input to output. Life of 1,000,000 operations at full electrical load.

(3) Switch to select alteration or continuous operation of either load.

(4) Mount in Magnal 11-pin socket.

(5) Operating temperature range of 4-degree F (-20-degree C) to 140-degree F (60-degree C).

(6) Manufacturer: ABB-SSAC type ARP series or approved equal.

E. MOTOR DRIVEN TIMERS - ON-DELAY AND OFF-DELAY:

(1) Time Delay Relay - Upon Energization (TDE) or Upon De-Energization (TDDE): TDE driven by a 120 Vac synchronous motor that starts timing when initiated by an external signal via closing a dry contact. Turn a knob on the front of the dial for time settings. TDE device will reset upon power failure. TDDE device will not reset upon power failure. Special configuration where specified: will not reset upon power failure.

(2) Provide a pilot light visible from the front of the timer to indicate when the timer motor is energized. Provide visual indication by a cycle progress pointer that advances to zero from the setting then back to zero as time progresses.

(3) Provide two of "instantaneous" NEMA Form-C output contacts that actuate when the timing is initiated. Provide two "delayed" NEMA Form-C contacts that actuate when the unit has timed out or de-energized. The timer automatically resets, when the timing cycle is completed. Contact ratings: 10-ampere at 120 Vac and 5-ampere at 240 Vac.

(4) Permanently mount and setup the timer with the initial settings shown or specified. Timer range with 16 configurations from 5-seconds to 60-hours. Range and timer setpoints shown on drawings.

- (5) Timer Manufacturer: Eagle Cycl-Flex Automatic or Manual Reset Timer: HP5 series or HP5E series; Automatic Timing Controls, Series 305D Motor Driven Analog Reset; or approved equal.

F. LATCHING RELAYS:

- (1) Manufactured to the specifications for load switching control relays except with dual coils for latch and unlatch positions.
- (2) Momentary energization of the latch or unlatch coils shall operate and mechanically hold the contacts in that position until the opposite coil is energized.
- (3) Contacts shall be included that preclude energizing both the latch and unlatch coils at the same time.

G. MOTOR TEMPERATURE SWITCH RELAYS:

- (1) Instrument Function: Motor high temperature measurement
- (2) Signal Input: NC temperature switch integral to motor
- (3) Signal Output: DPDT contact outputs rated at 10A @ 250Vac
- (4) Supply Voltage: 120Vac
- (5) Indicator: Green LED for normal conditions and red LED for fault conditions
- (6) Response Times: Operates in 10 ms, releases in 1 second
- (7) Temperature Switch Voltage: 12Vdc
- (8) Temperature Switch Current: 2 mA max
- (9) Additional Requirements: Relay shall retain its state during power failures and shall have connections for an external reset. When temperature switch opens, the relay shall energize and latch on until the temperature switch re-closes and the reset button is pressed.
- (10) Manufacturer: ATC Diversified Electronics SPM-120-ADA, or approved equal.

H. NAMEPLATES: Nameplates shall be provided in accordance with the requirements of Section SP-8.1.

8.5.06 MAGNETIC CONTACTORS:

A. LIGHTING CONTACTOR:

Lighting contactors shall be 100 percent rated for ballast and tungsten lighting, resistance and other non-motor loads.

Contactors shall be rated 600Vac, 60-Hertz with the ampere rating and number of poles as indicated on the drawings. Provide a minimum of two poles per NEMA ICS 2-211B for industrial-duty applications.

The following options shall be available and shall be provided as indicated on the drawings:

- (1) Auxiliary contacts rated 5 amperes at 600Vac.
- (2) Timer or time clock attachment.
- (3) Transient suppression module for 120Vac control circuits.
- (4) Electrically or mechanically held as specified.

Contactors shall be provided with disconnecting means and overcurrent protection mounted in the same enclosure.

Manufacturer: Allen Bradley Bulletin 500L or 500LP, Square D Class 8903, or approved equal.

8.5.07 ELAPSED TIME INDICATORS

Elapsed time indicators (meter) shall be conventional 3-1/2-inch square case meters designed for flush panel mounting. The meter shall be non-resettable and display elapsed running time of each motor/valve in hours by 6 digit dials. The meters shall be operable on 120 volt, 60 Hertz power.

8.5.08 CURRENT TRANSFORMERS AND TRANSDUCERS

Provide monitoring current transformers with 600Vac insulation and primary ampere rating as indicated with 5-ampere output.

Provide AC current transducer for any one of the phase conductors of the power circuit to be installed through onboard toroid. Provide a loop-powered transducer with input rated from 0 to 50 ampere with 4-20mADC analog output scaled for the primary current of the current transformer. Provide zero and span adjustments.

Manufacturer: ABB AC current transducer TCSA Series Loop Powered and mounting accessories, or approved equal.

Provide a DIN rail or back plate mounted AC current transducer that is a loop-powered transducer with input rated from 0 to 5-ampere and with 4-20mADC analog output scaled for the primary current of the current transformer.

Manufacturer: ABB AC current transducer DCSA Series Loop Powered and mounting accessories, or approved equal.

Nameplates shall be provided in accordance with the requirements of Section SP-8.1.

8.5.09 TERMINAL STRIPS, BLOCKS, AND DEVICES

- A. Power Wiring: Provide back plate mounted terminal strips rated at 600 Vac.
- B. Control Wiring: Provide a DIN rail with spring powered contact rated at 300 Vac, 24 ampere with pluggable terminals.
- C. Terminal identification standard to the product provided.
- D. MANUFACTURER:
 - (1) Standard: Allen Bradley or approved equal.
 - (2) Standard: DIN rail: Phoenix Contact or Weidmuller Z-Series.

8.5.10 DRY-TYPE TRANSFORMERS (600 VOLTS AND LESS)

- A. MANUFACTURERS:
 - (1) ABB
 - (2) General Electric
 - (3) Eaton Cutler-Hammer
 - (4) Siemens
 - (5) Square D
 - (6) Or approved equal.
- B. INSULATION:

Transformers temperature rise based on 40-degree C ambient temperature:

 - (1) 15 kVA and above: Minimum Class 220 insulation, maximum 115 degree C temperature rise.
 - (2) Less than 15 kVA: Minimum Class 180 insulation, maximum 115 degree C temperature rise.
- C. COILS:

Transformer coils:

 - (1) Copper.
 - (2) 15 kVA and above: impregnated with varnish.
 - (3) 10 kVA and below: encapsulated.
- D. WINDING CONFIGURATION:

Transformers shall have electrically isolated primary and secondary windings. Primary and secondary winding configurations shall be as specified or shown. Provisions shall be made to permit separate grounding of the neutral conductor and the enclosure. Single-phase transformers shall be the four-winding type.

E. TRANSFORMER TAPS:

Transformers 15 kVA and above shall be provided with two 2-1/2 percent full capacity taps above normal voltage and four 2-1/2 percent full capacity taps below rated voltage on the primary winding.

F. TERMINAL COMPARTMENTS:

Terminal compartments shall be sized to permit termination of cables specified. Terminal connections shall be made in the bottom third of the enclosure. The terminals shall be copper and sized for the cable specified.

G. ENCLOSURES:

Transformers enclosures:

- (1) 15 kVA and smaller: weatherproof, non-ventilated enclosures.
- (2) Indoor over 15 kVA: drip-proof, ventilated enclosures.
- (3) Outdoor: weatherproof enclosures.

H. MOUNTING:

Transformers 45 kVA and below shall be suitable for mounting within an MCC and/or wall mounting and include mounting brackets and hardware. Transformers over 45 kVA shall be floor mounting type.

I. NAMEPLATES:

Nameplates shall be provided in accordance with the requirements of Section SP-8.1.

J. SOUND LEVELS:

The sound levels shall not exceed the following values:

kVA	dB
0-9	40
10-45	42
50-450	45
225-300	50
500	54

K. NON-LINEAR LOAD K-FACTOR RATED TRANSFORMER:

(1) TYPE: 100 percent non-linear load rated specifically designed to handle non-linear loads with double size neutral for harmonic load.

(2) K FACTOR: $K = 13$.

L. SHIELDED ISOLATION TRANSFORMER:

Provide self-cooled two-winding type transformer with electrical ratings as shown.

Provide copper or aluminum metal shielding between primary and secondary windings.

Provide electro-static winding shield grounded to the transformer case.

8.5.11 GROUNDING SYSTEM

A. CABLE:

Ground cable shall be annealed bare copper, concentric stranded as specified. If cable sizes are not specified, the minimum sizes shall be as follows:

480V MCC and switchboards	4/0 AWG
Cable tray	4/0 AWG
Duct Banks	4/0 AWG
Lighting panels	4 AWG
Exposed metal	4 AWG
Control panel	

B. GROUND RODS:

Ground rods shall be copper covered steel, 3/4-inch diameter and 10 feet long. Rods shall have threaded type removable caps so that extension rods of same diameter and length may be added where necessary.

C. COMPRESSION CONNECTIONS:

Compression connection system shall be Burndy, Thomas & Betts, or approved equal. Material and tools of different manufacturers shall not be mixed.

Compression connections shall be irreversible compression connectors unless otherwise approved by DOW.

D. BOLTED CONNECTORS:

Bolted connectors shall be Burndy, Thomas and Betts, O.Z. Gedney, or approved equal.

E. BUILDING SYSTEM GROUND BARS:

Ground bars shall be a minimum of 2-inch (width) x 12-inch (length) x 1/4-inch (depth), and shall be solid copper. Assembly shall come complete with insulated wall brackets, mounting hardware and compression terminals. Erico #EGBA14212TES or approved equal.

F. WELDED CONNECTORS:

Exothermic welding products shall be Erico's Cadweld Plus system with a remotely operated battery powered electronic ignition device and moisture resistant weld metal cup for the required mold, or approved equal.

G. EQUIPMENT GROUND PLATE:

Equipment ground plate shall be two-hole copper flush mounted grounding plate, Erico Cadweld, Burndy YGF Series, or approved equal.

8.5.12 KIUC METERING EQUIPMENT:

A. METER SOCKETS:

(1) General:

- a. Meter socket shall include provisions for test switch and KIUC seals.
- b. Meter socket shall be current transformer rated, ring-type, 13-Jaw, 20A, 480/277V.
- c. Meter socket and its installation shall comply with all requirements of KIUC. Confirm exact specifications with KIUC prior to ordering.
- d. Provide grounding and bonding per NEC.
- e. Enclosure shall be Type 316 stainless steel, NEMA 3R rated.
- f. Meter socket shall be manufactured by Milbank, model UCSX3433, or approved equal.

B. CT CABINET:

- (1) CT cabinet shall be rated NEMA 3R, constructed of Type 316 stainless steel.
- (2) Cabinet dimensions shall be minimum 42-inches wide by 42-inches high by 11-inches deep.
- (3) CT cabinet shall have two fixed, solid handles on the cover for lifting.
- (4) Cabinet shall have provisions for KIUC seals.

- (5) Provide cabinet with horizontal "C" mounting brackets and vertical "Z" mounting brackets to mount KIUC instrument transformers. Install in accordance with KIUC requirements
- (6) Provide grounding and bonding per NEC.
- (7) CT cabinet and its installation shall comply with all requirements of KIUC. Confirm exact specifications with KIUC prior to ordering.

8.5.13 GENERATOR TERMINAL BOX: Wall-mounted connection/termination cabinet for mobile generator with mechanical set-screw lug landings for three phases and neutral plus ground. Rated minimum 600A, 480V, 35kAIC short circuit withstand, UL listed as a complete assembly to UL 1773 Standard for Termination Boxes. Bus shall be silver-plated copper, sized for 1000A per sq inch ampacity, supported by UL Recognized Component insulators. Enclosure shall be wall-mounted, rated NEMA 3R, constructed of aluminum, with ANSI-61 gray powder-coat finish. Provide lockable latches on front door; cable access panel at bottom of cabinet shall be held captive by front door. Wall-mount cabinet in accordance with manufacturer's anchorage requirements. Generator terminal box shall be Berthold Electric Generator Connection Cabinet or approved equal.

8.5.14 SECURITY DEVICES

A. PERSONNEL DOOR SECURITY CONTACT

a. General:

- a. Hermetically sealed magnetic reed switch contact to monitor open/closed position of personnel doors.
- b. Surface-mount aluminum housing.
- c. Contact shall be fully sealed in epoxy or polyurethane potting compound.
- d. 2" to 3" operating gap.
- e. Provide with mounting bracket.
- f. Minimum 36" of stainless steel armored cable wired to contact.

b. Contact Ratings:

- a. Normally open SPST (Form A) contact, 24V DC, minimum 0.1A

c. Manufacturer

- a. Interlogix/UTC (GE Sentrol) 2505A, Honeywell 960, or approved equal.

B. OVERHEAD (ROLL-UP) DOOR SECURITY CONTACT

(1) General:

- a. Hermetically sealed magnetic reed switch contact to monitor open/closed position of overhead roll-up doors.
- b. Contact shall be fully sealed in epoxy or polyurethane potting compound.
- c. Minimum 3" operating gap.
- d. Provide with mounting bracket(s) for floor and roll-up door mounting.
- e. Minimum 36" of stainless steel armored cable wired to contact.

(2) Contact Ratings:

- a. Normally open SPST (Form A) contact, 24V DC, minimum 0.1A

(3) Manufacturer

- a. Interlogix/UTC (GE Sentrol) 2205A or approved equal.

8.5.15 MISCELLANEOUS DETAILS

- A. Complete all panel circuit directories, using typewriter or printer. Verify "room" and "use" designations before typing.
- B. Prime and paint all new exposed conduits in accordance with manufacturer's instructions and SP-8.1.
- C. All grounding wire within building run in rigid steel conduit, and where practicable, routed together with circuit conductors.
- D. Furnish necessary test equipment and make all tests necessary to check for unspecified grounding, shorts and wrong connections. Correct faulty conditions, if any.
- E. Label all panels and service equipment. Identification labeling shall be by competent craftsmen. Letters to be 1 1/2-inch high minimum, black paint. Dynamo labels are not acceptable. Panel label designation: APANEL (Name) 120/208V, 3-phase, 4WSN". Tag all empty conduits in terminal cabinets and boxes giving destination. Use fiber disc tags in bushing.
- F. Provide arc flash warning labels on all electrical equipment as required by NEC Article 110.16 and SP-8.8.

8.5.16 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-8.6 – MOTOR CONTROL CENTERS

8.6.01 GENERAL REQUIREMENTS:

- A. The motor control center (MCC) lineup, including main circuit breaker and power monitoring section, low-voltage transformer and panelboard (where required), well pump starter sections, and chlorine booster pump starters shall be manufactured by Siemens, Square D, Eaton, or approved equal.
- B. The entire MCC shall be supplied as a complete, engineered assembly by the same manufacturer.
- C. The MCC and all components shall be ASSEMBLED, WIRED, and TESTED AT THE FACTORY as a system prior to shipment. All component parts listed in this portion of the specifications shall be UL Listed to UL 845 and shall conform to latest National Electrical Manufacturers Association (NEMA) Standards (NEMA ICS-1), whenever applicable.
- D. The entire MCC shall be rated 600 (480) volts, 60 Hertz, 3-phase, 4-wire as specified and shall be suitable for operation at the specified voltages and short circuit capacities. MCC shall be completely factory tested.

8.6.02 STRUCTURE AND CONSTRUCTION:

- A. STRUCTURE:
 - (1) Motor control centers shall be made of No. 14 gauge steel minimum and, unless otherwise shown on the drawings, each section shall be 90 inches high by 20 inches wide by 20 inches deep. The individual unit compartments shall be a minimum of 12 inches high.
 - (2) Each section shall have 72 inches for stacking starter units into the sections
 - (3) The compartments shall have pan-type doors with a minimum of two quarter-turn hold-down latches; and neoprene gaskets.
 - (4) A full height vertical wireway, 4-inch wide minimum, but not less than 30 square inches in cross section, shall be provided for each vertical motor control center section. The wireway shall contain full height removable doors. Horizontal wireways shall be provided top and bottom, extending the length of motor control centers.
 - (5) Bottom channel sills shall be mounted front and rear of the vertical sections extending the full length of the motor control center lineup. A removable lifting angle shall be mounted on top and shall extend the width of the motor control center lineup.
 - (6) All switches mounted on front panel of MCC shall be mounted no higher than 70 inches AFF. Emergency stop pushbuttons shall be mounted no higher than 60 inches AFF. Account for 3-1/2-inch concrete housekeeping pad.
 - (7) Nameplates shall be installed as shown on the drawings.

B. CONSTRUCTION:

- (1) Motor control centers located indoors shall have NEMA 1, gasketed enclosures.
- (2) Motor control centers located outdoors shall be NEMA 3R rated (door-in-door construction).
- (3) Starter units, size 4 and smaller, and feeder tap units less than 225 amperes shall be drawout plug-in construction with hardened, tin-plated copper free-floating stabs, steel spring backups. The door shall have interference tabs which prevent door closure if unit is improperly installed.
- (4) Units shall be latched in the position to assure proper bus contact. The unit disconnect device shall be interlocked to prevent removal or reinsertion of a unit when the disconnect is in the "ON" or "TRIPPED" positions.
- (5) Fusible switch or circuit breaker disconnect operators shall be capable of accommodating three padlocks for locking in the "OPEN" position.
- (6) Hardware for mounting future starter and feeder tap units shall be provided at compartments specified as "FUTURE".

C. SEISMIC BRACING: The Motor Control Centers shall be braced for Seismic Zone 4 as defined by the latest version of the Uniform Building Code.

8.6.03 FINISH AND COLOR: The finish and color shall be in accordance with SP-8.1.

8.6.04 BUS

A. GENERAL:

- (1) Bus shall be tin-plated copper with bolted connections between vertical and horizontal bus bars. Access for tightening these connections shall be from the front, without the need for tools on the rear of the connection. Insulated horizontal and vertical bus barriers shall be provided. Barriers shall be fabricated from high-strength, glass-filled polyester resin.
- (2) The bus shall be braced to withstand stresses resulting from the maximum short circuit current available. Minimum bracing shall be 65,000 amperes symmetrical. Bus bracing shall be verified with the results of the short circuit and arc flash analysis required by SP-8.7 and approved by DOW.

B. HORIZONTAL BUS: Unless otherwise specified or shown, the main horizontal bus shall be rated a minimum 600 amperes continuous.

C. VERTICAL BUS: Unless otherwise specified or shown, the main vertical bus shall be rated a minimum 300 amperes continuous.

D. GROUND BUS: A 1/4-inch by 2-inch tin plated ground bus shall be provided the full length of the motor control center (except the dedicated control sections). Ground bus shall

be located at the bottom of the motor control center. Provide a lug to terminate a bare 4/0 AWG copper ground conductors at each end of the ground bus. Ground bus shall not be continuous between motor control center and switchboard sections.

8.6.05 WIRING:

A. GENERAL:

(1) Motor control centers shall be provided with NEMA ICS 18 Class II, Type B wiring. All starter units shall have terminal blocks for control wiring. Terminal blocks shall be provided for power wiring for starters size 2 and smaller.

(2) Motor control centers shall be provided with all necessary interconnecting wiring and interlocking.

B. POWER WIRE: Power wire shall be copper 90 degrees C insulated, sized to suit load; minimum power wire size shall be No. 12 AWG copper stranded.

C. CONTROL WIRE: Control wire shall be No. 16 AWG stranded copper wire, rated 90 degrees C machine tool wiring (MTW) and UL listed for panel wiring.

D. TERMINATIONS AND CABLE CONNECTIONS:

(1) TERMINALS: Control wiring shall be lugged with ring-tongue or locking spade crimp type terminals made from electrolytic copper, tin-plated.

(2) CABLE CONNECTORS: Cable connectors for use with stranded copper wire, sizes No. 8 AWG to 1000 kCmil shall be UL listed. Dished conical washers shall be used for each bolted connection. Connectors shall be reusable and shall be rated for use with copper conductors. Incoming line and outgoing feeder compartments shall be provided with crimp type lugs, 3M Company, Burndy Company, or approved equal.

E. CONDUCTOR MARKERS: Markers used for identification shall meet the requirements of SP-8.1.

8.6.06 SPATIAL LAYOUT:

A. Motor control center space allocations indicated in these contract documents are based on a typical manufacturer's configuration. It shall be the contractor's and MCC supplier's responsibility to determine the actual space requirements based on the equipment supplied and the performance specified to ensure that the motor control center is supplied with the necessary spatial layout to accomplish the required functions within the available space. The motor control center overall dimensions shall not exceed the available space allocated for installation indicated on the Drawings unless otherwise approved by DOW.

B. For motor control centers that are to be installed into existing electrical rooms, provide shipping splits as required to allow installation through existing doors and passages to the final mounting locations.

8.6.07 SHIPMENT, PROTECTION, AND STORAGE:

- A. **PACKAGING AND MARKING:** All equipment shall be protected against damage from moisture, dust, handling, or other cause during transport from manufacturer's premises to site. Each item or package shall be marked with the number unique to the specification reference covering the item.
- B. **SHIPPING:** Damage shall be corrected to conform to the requirements of the contract before the assembly is incorporated into the work. The Contractor shall bear the costs arising out of dismantling, inspection, repair and reassembly.

8.6.08 MAJOR COMPONENTS: The following is a list of the major component parts of the MCC.

- A. **MAIN CIRCUIT BREAKERS:** These requirements apply to main protective devices connected to incoming power sources and feeding the MCC main bus, including the Generator Main Circuit Breaker.
 - (1) Circuit breakers shall be stored energy type mechanism to provide quick-make, quick-break, trip-free operation:
 - 1) Molded case UL listed 80 percent continuous current capacity.
 - (2) Circuit breakers shall provide manual switching operation by means of a low-torque handle or pushbutton on the front of the unit. Automatic operation during overload and short circuit conditions shall be provided by solid state or thermal magnetic tripping devices located in the circuit breaker frame as specified on the drawings.
 - (3) Circuit breakers shall be front accessible, stationary, individually mounted.
 - (4) Short circuit capacity shall be determined by the results of the short circuit and arc flash analysis required by SP-8.7 and approved by DOW, with a minimum short circuit capacity of 65,000 amperes symmetrical RMS at 480 Vac.
- B. **FEEDER CIRCUIT BREAKERS:**
 - (1) The following requirements apply to feeder circuit breakers protecting equipment fed from the MCC bus, including the booster pump motors and associated controller equipment.
 - (2) Circuit Breakers (Thermal Magnetic):

Thermal-magnetic circuit breakers shall be molded case equipped with toggle type handle, quick-make, quick-break over center switching mechanism that is trip-free so that breaker cannot be held closed against short circuits and abnormal currents. The tripped position shall be clearly indicated by breaker handle maintaining a position between "ON" and "OFF". All poles shall open, close, and trip simultaneously. Short circuit capacity shall be determined by the results of the short circuit and arc flash analysis required by SP-8.7 and approved by DOW, with a minimum short circuit capacity of 65,000 amperes symmetrical RMS at 480 Vac.

(3) Motor Circuit Protectors (Magnetic Only):

Magnetic circuit breakers shall be molded-case equipped with toggle type handle, quick-make, quick-break over center switching mechanism that is trip-free so that breaker cannot be held closed against short circuits and abnormal currents. The tripped position shall be clearly indicated by breaker handle maintaining a position between "ON" and "OFF". All poles shall open, close, and trip simultaneously. Short circuit capacity shall be determined by the results of the short circuit and arc flash analysis required by SP-8.7 and approved by DOW, with a minimum short circuit capacity of 65,000 amperes symmetrical RMS at 480 Vac.

C. THREE-PHASE DIGITAL MULTI-FUNCTION POWER MONITOR:

- (1) The Monitor shall be UL listed and CE marked.
- (2) Power meter shall be designed for Multifunction Electrical Measurement on 3 phase power systems.
 - a. Meter shall support 3-Element Wye, 2.5 Element Wye, 2 Element Delta, 4 wire Delta systems.
 - b. Surge withstand shall conform to IEEE C37.90.1 and ANSI C62.41 (6 kV)
 - c. The meter shall be user programmable for voltage range to any CT or PT ratio.
 - d. Meter shall have a burden of not more than 0.36VA per phase, Max at 600V, 0.014VA at 120 Volts.
 - e. Meter shall have a burden of not more than 0.005VA per phase, Max at 11 Amps.
 - f. The meter shall accept a voltage input range from 20 up to 576 Volts Line to Neutral, and a range from 0 up to 721 Volts Line to Line.
 - g. Meter shall accept a current reading of up to 10 Amps continuous. Start-up current for a 5 Amp input shall be no greater than 0.005 Amps.
- (3) Power meter shall use a dual input method for current inputs. Method one shall allow the CT to pass directly through the meter without any physical termination on the meter, ensuring the meter cannot be a point of failure on the CT circuit. The second method shall provide additional termination pass-through bars, allowing the CT leads to be terminated on the meter. The meter must support both termination methods.
 - a. Fault Current Withstand shall be 100 Amps for 10 seconds, 300 Amps for 3 seconds, and 500 Amps for 1 second.
 - b. Pass through wire gauge dimension of 0.177-inch / 4.5 mm shall be available.
 - c. All inputs and outputs shall be galvanically isolated to 2500 Volts AC.

- d. The meter shall accept current inputs of class 10: (0 to 10) A, 5 Amp Nominal, and class 2 (0 to 2) A, 1A Nominal Secondary.
- (4) The meter shall have an accuracy of +/- 0.1% or better for volts and amps, and 0.2% for power and energy functions. The meter shall meet the accuracy requirements of IEC687 (Class 0.2%) and ANSI C12.20 (Class 0.2%).
- a. The meter shall provide true RMS measurements of voltage, - phase to neutral and phase-to-phase; and current, per phase and neutral.
 - b. The meter shall calculate RMS readings, sampling at over 400 samples per cycle on all channels measured readings.
 - c. The meter shall utilize 24 bit Analog to Digital conversion.
 - d. The meter shall provide %THD (% of total Harmonic Distortion). Harmonic magnitude recording to the 40th order shall be available for voltage and current harmonics.
- (5) The meter shall provide a simultaneous voltage and current waveform recorder.
- a. The meter shall be capable of recording 512 samples per cycle for a voltage sag or swell or a current fault event.
 - b. The meter shall provide pre- and post-event recording capability.
 - c. The meter shall have a programmable sampling rate for the waveform recorder.
 - d. The meter shall have an advanced DSP design that allows power quality triggers to be based on a 1 cycle updated RMS.
 - e. The meter shall allow up to 170 events to be recorded.
 - f. The meter shall store waveform data in a first-in, first-out circular buffer to ensure that data is always being recorded.
- (6) The meter shall include a three-line, bright red, 0.56-inch LED display.
- a. The meter shall fit in both DIN 92mm and ANSI C39.1 round cut-outs.
 - b. The meter must display a % of Load Bar on the front panel to provide an analog feel. The % Load bar shall have not less than 10 segments.
- (7) Power meter shall have the capability of being upgraded in the field to add features without being removed. The meter shall be provided with the "V6" upgrade package that includes the following features: multifunction measurement with I/O expansion, 4 megabytes data-logging, harmonic analysis, TLC and CT/PT compensation, limit and control functions, and 512 samples per cycle waveform recorder.

- a. The virtual upgrade packs must be able to be implemented without physically removing the installed meter.
 - b. Meter shall be a traceable revenue meter, and shall contain a utility grade test pulse allowing power providers to verify and confirm that the meter is performing to its rated accuracy.
- (8) The meter shall include 2 independent communications ports on the back and face plate, with advanced features.
- a. One port shall provide RS485 communication speaking Modbus ASCII, Modbus RTU, or DNP 3.0 protocol through back plate.
 - b. Baud rates shall be from 9600 baud to 57600 baud.
 - c. The meter shall provide an optical IrDA port (through faceplate), as the second communication port, which shall allow the unit to be set up and programmed using a PDA or remote laptop without need for a communication cable.
 - d. The meter shall have Pocket PC based software available for remote programming and integration.
- (9) The meter shall provide user configured fixed window or rolling window demand. This shall allow the user to set up the particular utility demand profile.
- a. Readings for kW, kVAR, kVA and PF shall be calculated using utility demand features.
 - b. All other parameters shall offer max and min capability over the user selectable averaging period.
 - c. Voltage shall provide an instantaneous max and min reading displaying the highest surge and lowest sag seen by the meter.
 - d. The meter shall provide upgrade rate of 6 cycles for Watts, Var and VA. All other parameters shall be 60 cycles.
- (10) The meter shall support power supply of 90 to 265 Volts AC and 100 to 370 Volts DC. Universal AC/DC Supply shall be available and shall have burden of less than 11VA.
- (11) The meter shall provide Limits Alarms and Control Capability as follows:
- a. Limits can be set for any measured parameter.
 - b. Up to 16 limits per parameter can be set.
 - c. Limits shall be based on % of Full Scale settings.
 - d. Manual Relay Control shall be available through software.

- e. Relay set delays and reset delays shall be available.
- (12) The meter shall have data-logging capability. Refer to paragraph G. Three Phase Digital Multi-function Power Monitor, subparagraph 7, for upgrade pack to be included. The meter shall have a real-time clock that allows for time stamping of all the data in the meter when log events are created. The meter shall have six logs; the meter shall also have the Waveform Log:
- a. The meter shall have three historical logs for trending profiles. Each log shall be capable of being programmed with up to 64 parameters. The user shall have the ability to allocate memory between the three historical logs in order to increase or decrease the memory allotted to each of the logs.
 - b. The meter shall have a log for Limits Alarms. The Limits log shall provide magnitude and duration of an event, time-stamp, and log value. The log must be capable of recording to 2048 events.
 - c. The meter shall have a log for System Events. The System Events log shall record the following occurrences with a time-stamp: Demand Resets, Password Requests, System Startup, Energy Resets, Log Resets, Log Reads, and Programmable Settings Changes.
 - d. The meter shall have a log for I/O changes. The I/O Change log shall provide a time-stamped record of any Relay Outputs and any Input Status changes. The log must be capable of recording up to 2048 events.
 - e. The meter shall have a log which is capable of recording a waveform both when a user-programmed value goes out of limit and when the value returns to within limit.
- (13) The meter shall have I/O expandability through two Option card slots on the back.
- a. The cards shall be capable of being installed in the field, without removing the meter from installation.
 - b. The meter shall auto-detect the presence of any I/O Option cards.
 - c. The Option Card slots shall accept I/O cards in all of the following formats: 100BaseT Ethernet Communication Card; Four Channel Bi-directional 0-1 mA Output Card; Four Channel 4-20mA Output Card; Two Relay Outputs/2 Status Inputs Card; Four Pulse Output/4 Status Inputs Card; Fiber Optic Card.
 - d. The meter shall be capable of accepting any combination of up to two cards.
 - e. Provide the meter with the Ethernet Option Card, which shall provide the meter with 100BaseT Ethernet functionality. The Ethernet Option card shall:
 - 1) Allow the meter to speak with 12 simultaneous sockets of Modbus TCP, so that multiple requests for data can be received simultaneously.

- 2) Allow auto transmit/receive detection for straight or null RJ45 cables.
- (14) The meter shall have transformer loss, line loss, and total substation loss compensation.
 - a. Substation losses shall be programmable for Watts and VARs, and for ferrous and copper losses.
- (15) The meter shall have a standard 4-year warranty.
- (16) Power meter shall be able to be stored in (4 degree F (-20 degree C) to 158 degree F (70 degree C)). Operating temperature shall be (4 degree F (-20 degree C) to 158 degree F (70 degree C)).
 - a. NEMA 12 faceplate rating shall be available for the power meter.
- (17) Acceptable product is Electro Industries/GaugeTech, Model Shark 200-0-10-V6-D2-INP100S-X-X Meter or approved equal.

D. REDUCED-VOLTAGE SOLID-STATE STARTERS:

(1) Scope of Work:

- a. This specification describes the performance, functional specifications and fabrication details for a digital reduced voltage, stepless, solid state motor starter that shall provide a selectable voltage ramp, current limit or torque ramp (all standard) method of soft starting 3-phase AC induction motors.
 - 1) The motor starter shall be self-contained and house the solid-state controller, motor overload protection (Class 10 through Class 30 selectable), an integral bypass contactor and a disconnect means as required on the drawings, in one MCC section.
- b. They are for use with National Electrical Manufacturers Association (NEMA) design B, AC motors to reduce the current in-rush as well as mechanical shocks that can result from starting or stopping a motor across the line.

(2) Quality Assurance:

- a. Codes and Standards
 - 1) Unit(s) must be manufactured to the codes listed below:
 - (a) National Electrical Code
 - 2) Unit(s) must be approved and/or certified by, and carry the label(s) of one or more of the following organizations:
 - (a) Underwriters Laboratories (UL)

- (b) Canada Standards Association (CSA) or cUL is acceptable
- 3) The complete starter units shall be UL listed under UL 845 as part of the MCC.
- b. Manufacturer's Qualifications:
 - 1) The manufacturer shall be a certified ISO 9002 facility.
 - 2) All incoming material shall be inspected and/or tested for conformance to quality assurance.
 - 3) Power semiconductors shall be fully tested for proper electrical characteristics (dv/dt, di/dt, etc.).
 - 4) All subassemblies shall be inspected and/or tested for conformance to vendors engineering and quality assurance specifications.
 - 5) Printed circuit boards shall be burned in for a minimum of 48 hours at 60°C.
 - 6) The complete unit shall be functionally tested under load before shipment to assure proper operation per specification. Complete test reports shall be available upon request.
- (3) Warranty: A one-year warranty shall be provided on materials and workmanship from date of acceptance of the project completion.
- (4) Features:
 - a. Design Specifications
 - 1) Power Ratings
 - (a) Input: 200 – 460V $\pm 15\%$, 3 phase 50 / 60Hz (selectable) $\pm 10\%$. Unit(s) will operate with any incoming phase sequence.
 - 1. Output: Reduced voltage 3 phase AC derived from phase-angle fired inverse-parallel thyristors, ramped to full voltage.
 - 2. Current Rating(s): Shall be, at a minimum, capable of the motor Full Load Amps for the Horsepower(s) indicated on the drawings, including any Service Factors.
 - a) Current ratings of starter chassis must be based on manufacturer's data showing they were tested at 50°C. Units with current ratings tested at 40°C will be sufficiently oversized to match this requirement and prospective alternate bidders will provide proof of this over sizing prior to receiving approval to bid.

3. Output Overload Capacity: Shall be as follows, based upon motors indicated on the drawings and specified elsewhere;
 - a) For units used on motors where Class 10 overload protection is required, the soft starter shall be callable of delivering 550% of the motor FLA for 10 seconds.
 - b) For units used on motors where Class 20 overload is required, the soft starter shall be capable 500% of motor FLA for 20 seconds.
 - c) If the motor is capable of Class 30 protection, the soft starter shall be capable of delivering 550% current for 30 seconds.
 - d) Continuous duty rating shall be for the motor FLA plus + 15%.
 - e) Lighter duty rated starters are not acceptable
 4. SCCR (Short Circuit Current Rating) Listing: Combination starter units shall be UL listed to withstand the Available Fault Current of the system as indicated on the drawings or as determined prior to installation. For retrofit applications, both the soft starter and circuit breaker shall be supplied so that the SCCR rating of the combination is capable of withstanding the Available Fault Current. SCCR ratings in combination with the Circuit Breaker shall be published and supplied by the manufacturer with submittals.
 5. Control Power: 120VAC, 60Hz provided by a Control Power Transformer with primary and secondary fusing, adequate to operate all associated devices in each starter.
- 2) Power Current Switching Devices (SCRs):
- (a) PIV RATINGS: Minimum 2.5 times nominal line voltage.
 1. Protection: RC snubber network circuits on each phase assembly and MOV protective devices on the gate circuits.
 2. Efficiency: 98.5% through SCRs, 99.97% when bypass is engaged.
 - 3) Bypass Contactor: All units shall have an integral Bypass Contactor to shunt motor power around the SCRs when at full speed. The soft starter shall include all necessary control circuitry to accomplish this without the need for external timers and engage the Bypass Contactor only when the microprocessor has determined that the motor has reached speed.
 - (a) Overload Protection shall be integral and continuous so that it is in the motor circuit at all times, even when the Bypass Contactor is engaged.

- (b) Decel Interlocking shall be integral to allow the soft starter to automatically disengage the Bypass Contactor when a Decel command is given.
 - (c) Units which use external Bypass Contactors will be considered, but shall still meet the all of the above control and protection conditions. They shall also meet the SCCR ratings as required above.
- 4) Ambient Conditions:
- (a) Temperature: As a standard of unit design quality, starter shall be documented to show that the open chassis design has been tested for 0 – 50° C (-32 to 122° F) operation. Enclosed units shall be designed for 0 – 40° C ambient unless indicated elsewhere.
 - (b) Altitude: 3300 ft (1000 m) without derating, 16,500ft (5000m) maximum.
 - (c) Humidity: 0 – 95% RH, non-condensing.
- b. Product Features:
- 1) Acceleration Control shall be fully adjustable in programming to match any application. As a minimum, starter shall come complete with the following settings:
 - (a) Ramp Type: To ensure maximum flexibility in matching any unforeseen load conditions in the field, the starter shall provide all of the following methods of closed loop acceleration ramp control: Voltage Ramp, Current Limit Only (Current Step) or Closed Loop Torque. In addition, the soft starter shall be capable of being programmed to start the motor Across-the-Line for testing purposes. To avoid problems in commissioning once the field application conditions are known, any starter that has limited ramp choices will not be acceptable.
 - (b) Starting Torque: Initial torque output shall be programmable as either Voltage or Torque output depending on the selected ramp profile, and adjustable between 50-200% of motor Full Load Torque.
 - (c) Maximum Current Limit: To ensure acceptability to power conditions and reliability of starting under any circumstance that the motor can function in, a Current Limit function shall be available in all starting ramp modes, adjustable between 150 and 550% of the unit rating. Starters which do not provide Current Limit in all starting modes will not be acceptable.
 - (d) Ramp Time: The time between Initial Torque and Full Output shall adjustable between 1 and 360 seconds.
 - (e) Kick Start: To provide for starting of difficult loads, the starter shall include a Breakaway Pulse (Kick Start) feature that will apply a high

output for a short time on initial start command. The Kick Start voltage level shall be adjustable from 40 – 100% voltage, for 0.1-2 seconds max.

- (f) Motor heating function that will maintain motor above dew point when a run signal is not applied. Functions by passing a small amount of DC current through the motor windings on motors which include a thermistor or PTC temperature device.
- (g) Slow Speed Jog: For checking rotation at start-up or other testing procedures, the starter shall provide a programmable Slow Speed Jog feature, initiated by the Operator Interface or via input. The Slow Speed Jog output shall be programmable as a percentage of the base motor speed, not exceeding 21%.
 - 1. Slow Speed Reverse: For testing purposes or to provide for special applications as indicated on the drawings, the soft starter shall be capable of rotating the motor in the reverse direction upon command from the operator interface or via inputs. This feature shall be integral to the soft starter or modifications shall be provided to accommodate it.
- 2) Deceleration Control (Controlled Ramp Down): To facilitate the controlled deceleration of pumps and other loads, Decel Torque Control and/or Pump Control shall be built in and selectable with the following adjustments, all of which are independent of any Acceleration Ramp settings:
 - (a) Deceleration Ramp Time: adjustable from 0 – 360 seconds to allow gentle controlled deceleration in excess of the natural coast-to-stop time of the load.
 - (b) Stop Torque Level, adjustable from 10-100% to automatically turn off the starter when the output torque has reached a desired level, i.e. when a check valve has closed.
- 3) Selectable Ramp Profiles: To accommodate changeable conditions, the starter shall provide 3 separately adjustable ramp profiles, selectable via a dry contact closure. Each ramp will provide all of the above features.
- 4) Motor and Load Protection shall be integral to the starter assembly. All current referenced protection features shall be automatically calculated from the motor nameplate FLA as entered by the user. All time based protection features shall have retentive memory so that they remain active should the power fail and be restored. Starter shall provide the following functions:
 - (a) I^2t Thermal Overload shall be provided by the on-board microprocessor control based on inverse time-current trip curves as defined by NEMA trip curve Classes. The trip curves classes shall be programmable from between Class 5 and Class30 and the starter shall be UL listed to provide each individual class. As the most important protection feature of a starter,

the overload protection shall be based on a Motor Thermal Model retained in memory and provide the following features:

1. Retentive Thermal Memory shall be used to ensure that the overload protection does not lose track of motor temperature after the power is lost or shut down. Upon reapplication of power, the microprocessor shall be updated as to the motor thermal state. This feature shall be capable of being over ridden for emergency re-start applications.
2. Manual or Automatic Reset shall be selectable in programming to provide for automatic reset in unattended remote applications.
3. Thermistor Input shall be provided in case the motor or equipment arrives with integral Thermistors to monitor temperature. The Thermistor input shall provide for a motor thermal temperature monitoring that will bias the Motor Thermal Model mentioned above based on actual motor temperature.
 - a) The Thermistor monitoring circuit shall detect broken or shorted field devices or wiring.
 - b) Units without this feature shall provide external Thermistor Protection Relays if necessary and provide a way for the soft starter to display a Thermistor Trip independently of a Motor Overload trip.
- (b) Phase-Loss Protection shall be standard and shut down the starter if current through any leg drops to 20% of the programmed motor FLA or less, independent of line voltage levels.
 1. For purposes of testing with smaller motors, each starter shall be capable of having the motor FLA adjusted down to 20% of the unit Max Amp rating so that this feature will not trip if a load less than 20% of that setting is connected (i.e. 4% of unit max. rating).
- (c) Phase Current Imbalance shall be used to bias the Motor Thermal Model so that the tripping curve reflects the additional motor heating caused by the imbalance.
 1. The “Pick-up Point” of this feature shall be programmable or able to be defeated so that nuisance tripping can be avoided.
- (d) Ground Fault Protection shall be included which will prevent a start-up if any phase is connected to Ground or trip while running.
- (e) Over Current / Shear Pin Protection shall be provided. This Over Current trip shall be adjustable at lower levels than the Thermal Overload protection for the purpose of protecting mechanical components from undue shock when rapid unexpected load changes occur.

1. Adjustment level shall be from 50% to 150% of the programmed motor FLA
- (f) Under Current / Load Loss Protection shall shut down the starter on an adjustable Under Current condition. This shall be programmable as follows:
1. Adjustment level shall be from 19% to 100% of the programmed motor FLA
- (g) Multiple motors (2) shall be capable of being accommodated in case the soft starter is temporarily connected to a spare motor where the motor protection parameters differ and the primary motor will be used again. Selection between the motor profiles shall be via the Operator Interface or communications port.
- (h) Over and Under Voltage Protection will cause a trip if the voltage dips or surges beyond the unit tolerance limits for both the line voltage and the control voltage, differentiating the trip cause between the two systems on the Operator Interface Display.
- 5) Starter Protection shall be provided to maintain reliability of both the equipment and the circuit components, with the following features:
- (a) Shorted SCR / Welded Contactor Detection shall be standard. This function must automatically prevent the next start when at least one SCR is shorted or the Bypass Contactor is welded.
 - (b) Starter Overtemp Trip shall be built-in and protect the SCRs from excessive heat build-up in the heat sink. This function shall also detect a broken wire or defective sensor.
- 6) Conformal coatings shall be factory applied to all circuit boards and circuit board components that allow and/or benefit from such treatments.
- 7) Control Location shall be programmable to be any of the following choices: Control (Digital) Inputs, Operator Interface / keypad, PC viaserial comm. port., PLC via Profibus or Profinet or Profinet interface or PC via Profibus or Profinet interface. The Operator Interface display shall graphically indicate which control point being used.
- (a) When remote control via the Profibus or Profinet interface is being used, the ability to override that control point via digital input will be provided for testing or troubleshooting.
- 8) Input / Output features shall be as follows:
- (a) Four (4) Inputs shall be provided for the control and option selection of the starter as follows. All input and control devices shall be 24VDC control from a built-in power supply, requiring only dry contact closures.

All I/O termination points shall incorporate easily removable terminal blocks to facilitate quick change-out or troubleshooting isolation in the field.

1. Input commands shall be programmable for any one of the following functions; Motor Right (Fwd), Motor Left (Rev), Parameter Set 1, 2 or 3, Trip Reset, Quick Stop, Slow Speed, Emergency Restart, and Local Override for allowing local control when using Serial Communications as the control point.
- (b) Four (4) Output Relays shall be provided; three outputs shall be Form A (SPST), the fourth shall be Form C (SPDT), all rated for 240VAC, 3 Amps max.
1. Each relay shall be fully programmable for any one of the following functions; PIO Output 1, PIO Output 2, Input Status (1-4), Run up (Accelerating), Operation/bypass, Coasting down, On time motor (Running), Motor-on commanded, DC braking Contactor, Group warning (no trip), Group error (Fault trip), Bus error, Device (starter) error, Power on, Ready to start.
- 9) Operator Interface panel shall be included which provides simple to use adjustment and status indication on a dead-front shroud of the starter. This panel shall be capable of being remotely mounted up to 10ft (3 meters) away from the starter chassis, such as on the front door of the enclosure.
- (a) Adjustments shall be made by keypad with tactile feedback keys for high noise environments. No binary coded dialswitches shall be used for programming. Pass code protection shall be available to prevent unauthorized changes to the programming.
- (b) Graphical User Display shall be backlit LCD for long life and visibility in low contrast environments. Display shall have a minimum of 4 lines of alpha-numeric characters, programmable in 4 languages and capable of displaying all digits in displayed parameter so that operators do not need to calculate current values over 999A.
- 10) Metering functions shall be provided through the Alpha-Numeric Display for indicating the following;
- (a) Output Current for each individual phase. Indicating range to be 0.0 – 9999 amps
 - (b) Voltage: Phase-to-phase and Phase-to-ground voltages shall be available for display
 - (c) Frequency, for use in generator operation diagnostics.

- (d) Motor Thermal Status to indicate heat build-up in the motor. Range shall be 0 – 100% of the motor thermal capacity and count up towards 100% while heating.
 - (e) Elapsed Time shall indicate the number of hours that the starter has been in a Run condition, maximum 100,000 hours.
 - (f) Start Counter, indicating the number of Run commands given.
- 11) Serial Communications shall be provided as follows:
- (a) Starter shall have either a RS232 or RS485 digital communication port
 - (b) Communications protocol shall be Profibus or Profinet.
 - (c) PC interface and software shall be available either through the local programming port via USB connection, or over the Profibus or Profinet connection (if installed)
- 12) Historical Data shall be recorded and displayed, plus made available for communication. It shall be retained in non-volatile memory for viewing by service personnel later.
- (a) History shall include fault conditions experienced by the starter and peak running details

(5) Mechanical Construction

- a. Power Terminations shall be made on factory supplied mechanical lugs of sufficient size to accommodate the required wire for the line and load. Lugs are to be clearly marked as Line (L1, L2, L3) and Load (T1, T2, T3) and with appropriate tightening torque specifications.
- b. Control Terminations to the soft start main unit shall be on terminal strips that can be removed easily without the need to special tools.

(6) MOTOR DATA: The soft start shall be designed to operate a NEMA design B motor with a nameplate rating of one standard horsepower size larger than nameplate rating of motor being provided, for cooler operation of the SCRs. Design shall allow for heavy duty operation if available.

(7) Control Options:

- a. The soft start's control circuit shall be completely independent of its power circuit and adaptable to 240, 380 or 460 VAC, 50 or 60 Hz. The peripheral soft start control circuitry shall be operated at 120 VAC, 60 Hz from a control power transformer included within the MCC soft start's section.
- b. The soft start shall accept control logic either by operator devices (pushbuttons, selector switches, etc.) wired directly to the unit or from external relay logic, including but not limited to the following:

- 1) Three position H-O-A switch that provides for manual (HAND) start or remote signal (AUTO) start from remote relay contacts.
- 2) Red RUN pilot light illuminated whenever the soft start is provided with a run command and no fault condition is present.
- 3) Green STOP pilot light illuminated whenever the soft start is supplied with control power and no run command is present.
- 4) All operator devices shall be panel door-mounted using supplied 120 VAC control logic. Clearly labeled terminals shall be provided.

(8) Installation:

- a. The FLA motor amps shall be input into the starter memory via the keypad.
- b. Adjust all circuit breakers, switches, access doors and operating handles for free mechanical and electrical operation as described in manufacturer's instructions.
- c. Clean interiors of all enclosed electrical equipment to remove construction debris, dirt and shipping materials.

(9) Software: A software package shall be provided for full programming via a PC running under MS Windows OS, connectable via a USB cable to the soft starter.

(10) Manufacturer: Siemens 3RW44 or approved equal

E. Three Phase Electric Motor Protector shall be a SymCom, Inc. Model No. 777 or approved equal.

(1) Input Voltage:

- a. 200 - 480 VAC, 3 phase (Standard)
- b. 500-600 VAC, 3 phase (Available).

(2) Frequency: 50 or 60 Hz

(3) Motor Full Load amp Range:

- a. 2 - 90 Amps, 3 ϕ (Direct)
- b. 91 - 800 Amps, 3 ϕ (External CT's)

(4) Programmable Operating Points:

- a. LV - Low Voltage Threshold: 170V (450V*) - HV Setting
- b. HV - High Voltage Threshold: LV Setting - 528V (660V*)

- c. VUB - Voltage Unbalance Threshold: 2 - 15% or 999\
- d. MULT - # of Loops or CT Ratio (XXX:5): 1 - 10 Loops or 100-800
- e. OC - Over Current Threshold: (20 - 100A) / MULT
- f. UC - Under Current Threshold: (0, 10 - 98A) / MULT
- g. CUB - Current Unbalance Threshold: 2 - 25% or 999 OFF)
- h. TC - Over Current Trip Class: 5, J5, 10, J10, 15, J15, 20, J20, 30, J30
- i. RD1 - Rapid Cycle Timer: 2 - 500 Seconds
- j. RD2 - Restart Delay After All Faults Except Under Current (Motor Cool Down Timer): 2 - 500 Minutes
- k. RD3 - Restart Delay After Under Current (Dry Well Recovery Timer): 2 - 500 Minutes
- l. #RU - Number of Restarts After: 0, 1, 2, 3, 4, A (Automatic)
- m. ADDR - RS485 Address: A01 - A99
- n. #RF - Number of Restarts After All Faults Except Under Current: 0, 1, oc1, 2, oc2, 3, oc3, 4, oc4, A, ocA
- o. UCTD - Under Current Trip Delay: 2 - 60 Seconds
- p. GF - Ground Fault Current Threshold: (3 - 20A) / MULT or OFF

(5) Physical Specifications:

- a. Low Voltage: 4 seconds
- b. Output Contact Rating (Pilot Duty) SPDT: 480 VA @ 240 VAC
- c. Transient Protection (Internal): 2500 V for 10 mSeconds

(6) Accuracy:

- a. Voltage: +/- 1%
- b. Current: +/- 3% (<100 amps direct)
- c. Timing: 5% +/- 1 Second

(7) Repeatability:

- a. Voltage: +/- 0.5%

b. Current: +/- 1% (<100 amps direct)

(8) Temperature Range: 0 - 70 degrees Celsius

(9) Dimensions: 3.0" H x 5.1" D x 3.6" W

(10) Power Consumption: 10 Watts (Max.)

(11) Weight: 1.2 lbs.

(12) Motor saver shall be provided with the MODBUS Output monitoring port.

F. Three Phase Electric Motor Protector Remote Manager shall be a SymCom, Inc. Model RM-2000 with an RS485MS-2W serial interface for connection to the SymCom, Inc. Model 777-KW Motor Protector, or approved equal.

(1) Control Voltage - 115VAC +/- 10%; 50-60 Hz

(2) Transient Protection (Internal) - 2500 V for 10ms

(3) Power Consumption - 3 Watts (Maximum)

(4) Communication Ports:

a. 1 Port for MS777

1) Setup: Even Parity, 1 Stop Bit

2) Baud Rate: 9600

3) Protocol: Modbus RTU

4) Available Addresses: 01

5) Serial Interface: RS485

b. 1 Port for PC, PLC, etc.

1) Setup: None, Odd, or Even

2) Baud Rate Parity Protocol: 1 or 2 Stop Bits

3) Available Addresses: 300 – 28800

4) Serial Interface: Modbus RTU; A01 - A99; RS485

c. Real-time Clock:

1) Y2K: Compliant

- 2) Battery Back-up Life: 10 years @ 25 degrees Celsius without external power.
 - 3) Last fault memory: Stores up to 4 faults with time and date stamp, includes voltages and currents at the time of trip.
- d. Output Relays:
- 1) (option 1): Consult Factory for Function of Relays
 - 2) Configuration: Two Independent Electro-Mechanical Form C(SP DT)
 - 3) Contact Material: Silver/Tin Oxide
 - 4) Pilot Duty Rating: 240 VA @ 120 VAC
 - 5) General Purpose Rating: 5 A @ 120 VAC
- e. Analog Output (option 2):
- 1) Types: 0-20 mA, 4-20 mA, 0-5 VDC, 0-10 VDC (specify with order, for others consult factory)
 - 2) Output Signal: KW, PF, Amps, or Volts
 - 3) Maximum Load: (Software Selectable)
 - (a) 0-20 mA: 500 Ohms max.
 - (b) 4-20 mA: 500 Ohms max.
 - (c) 0-10 VDC: 2 kilo Ohms min.
 - (d) 0-5 VDC: 2 kilo Ohms min.
 - 4) Accuracy: +/- 1% @ 25 degrees Celsius
 - 5) Isolation: 1 kVrms
- f. Analog/Digital:
- 1) Inputs (option 3): Consult Factory
- g. Physical Specifications: Remote Manager.
- 1) Certifications:
 - (a) UL: UL 508
 - (b) cUL: cUL 508

(c) CE: Pending

h. Environment:

- 1) Class of Protection: NEMA 4x (Pending)
- 2) Ambient Operating Temp.: -20 to 70 degrees Celsius
- 3) Ambient Storage Temperature: -30 to 70 degrees Celsius
- 4) Humidity: Up TO 85%, non-condensing

i. Enclosure:

- 1) Dimensions: 6.1" L x 6.5" W X 1.1" D
- 2) Weight: 1.2 lbs.
- 3) Material: Black Polycarbonate

j. Display: Liquid Crystal with extended temp range.

- 1) Size: 2 rows x 20 characters
- 2) Lighting: LED Back-Light

k. Keypad: Eight 0.5" stainless steel dome buttons for tactile feedback.

- 1) Mechanical Life: 50,000 actuations
- 2) Overlay Material: Polyester
- 3) UV Exposure without degradation: 2000 Hrs.

l. Terminal: Depluggable terminal block.

G. WELL PUMP CONTROL CIRCUIT SEQUENCE TIMER:

- (1) Miniature programmable logic controller sequence timer to control well pump operational cycle timing. Program timing functions to meet the requirements specified on the drawings.
- (2) Operable on 120V, 60Hz supply.
- (3) Integral graphic display for control and programming.
- (4) Sequence timer inputs and outputs shall be expandable via I/O expansion modules. Provide I/O expansion modules as required to perform the functions shown on the drawings.

- (5) Manufacturer: Siemens LOGO! 8 series or approved equal.
- H. ELAPSED TIME METER: Provide as specified in Section SP-8.5.
- I. SELECTOR SWITCHES:
- (1) Provide as specified in Section SP-8.5 for all MCC starter cubicle switches.
- (2) For the SCADA Cabinet selector switch provide a panel mounted, single pole, 3-position, rotary, cam operated with fixed pistol grip handle. Contact action shall not be dependent upon springs. Contacts shall be 20 ampere, 600 volts, maintaining type. Switch shall meet NEMA 1 requirement for panel mounting. Switch shall be provided with escutcheon plates. Switch shall be General Electric SBM series or approved equal.
- J. MECHANICAL TIME CLOCK:
- (1) 7-day mechanical timer with programmable schedules for each day. Provide one time clock for each well pump motor starter.
- (2) Timer shall include skip-a-day feature, manual override until next on/off cycle, and optional reserve power to maintain timing cycle for 24 hours during power outages.
- (3) Enclosure shall be NEMA 1, metal.
- (4) Timeclock rated for operation on 120V, 60Hz supply.
- (5) Contacts shall be rated 120-277V, 40A.
- (6) Mount time clock to face of MCC in accordance with manufacturer instructions and wire to well pump starter control circuit in accordance with the drawings.
- (7) Manufacturer: Tork W100L or approved equal.
- K. NAMEPLATES: Provide 1/8-inch dilecto or approved equal with beveled edges. Lettering shall be white and of Gorton Normal Double Line design. Height and description as shown on drawings.
- L. CONTACTORS: The contactors in the pump motor control circuit shall be NEMA rated, Size 0 minimum with coil surge suppression unit.
- M. TIME DELAY RELAYS: Provide as specified in Section SP-8.5.
- N. AUXILIARY RELAY: Provide as specified in Section SP-8.5.
- O. EMERGENCY STOP – RESET PUSHBUTTON: The emergency stop switch shall be push-pull type, complete with Square D Class 9001 switch or approved equal, with maintained contact attachments, and Type TR red mushroom push button unit. The switch shall be labeled EMERGENCY STOP.

- P. INDICATING LIGHTS: Provide as specified in Section SP-8.5.
- Q. MOTOR HIGH TEMPERATURE SWITCH RELAY (TSH): Provide as specified in Section SP-8.5.
- R. CAPACITORS AND CAPACITOR BREAKERS:

The KVAR rating of the capacitors shall be sized to correct power factor of motor and associated controls to approximately 95%, not to exceed unity, at full load conditions. Capacitors shall be designed and manufactured according to NEMA standards, and rated in continuous KVAR, voltage and frequency for operating within the ambient temperature range of 60 degree F to 90 degree F. They shall be subject to all NEMA standard dielectric tests. They shall be filled with nonflammable high dielectric liquid and be individually fused with current-limiting fuses. Askarel and insulating liquids containing polychlorinated biphenyls (PCB's) shall not be provided.

Capacitor circuit breakers shall be thermal-magnetic type and be suitable for capacitor furnished. Breaker rating shall be approximately 150 percent of capacitor rated current or per circuit breaker manufacturer's recommended size.

- S. CAPACITOR ISOLATION CONTACTOR: The capacitor isolation contactor shall be NEMA rated and provided to isolate the capacitors from the pump motor feeder circuit during starting of the pump motor. Rating of the isolation contactor shall match or exceed the capacitor circuit breaker rating.
- T. DRY-TYPE TRANSFORMERS (600 VOLTS AND LESS): As specified in Section SP-8.5.
- U. PANELBOARDS (600 VOLTS AND LESS): As specified in Section SP-8.5.
- V. PROTECTIVE DEVICE RATINGS AND SETTINGS: Device ratings and adjustable settings shall be as specified in the short-circuit and coordination study detailed in Section SP-8.7.
- W. WIRING:

All MCC wiring shall be color coded or labeled with permanent markers to identify individual circuit/runs.

Provide elementary and connection diagrams for each starter unit and an interconnection diagram for the entire motor controller switchboard.

- X. STRIP HEATERS: Provide 500-watt strip heaters with perforated guards at the rear of motor starter cubicles, SCADA cabinet, and instrumentation display board. Strip heaters shall be powered via the 120V panelboard and controlled by remote thermostat. Thermostat shall be Pentair TWR60 or approved equal.
- Y. INSTRUMENT TRANSFORMERS:

- (1) General: Instrument transformers shall be molded dry-type in accordance with ANSI C57.13. Transformer volt-ampere rating shall be suitable for carrying the specified load without overheating or exceeding the permissible accuracy for the transformer.
- (2) Potential Transformers: Potential transformers shall have an ANSI accuracy class of 0.3. They shall be equipped with current limiting fuses.
- (3) Current Transformers: Current transformers shall be furnished with the specified ratios. The accuracies shall conform to ANSI C37.20.

8.6.09 MANUFACTURER'S SERVICES: Provide a factory-trained representative at the site for the specified quantity and duration of the following activities. Specified durations do not include travel time to or from the project site. The factory representative shall anticipate a minimum of 2 separate trips to the project site.

- A. Training Sessions: Provide a minimum of 8 hours of classroom field training on the motor controller switchboard installation. Certify completion of training on Form SP-8-H, Section SP-8.6.
- B. Start-up and Testing Assistance: Provide a minimum of 8 hours of on-site support for start-up and testing. Complete form SP-8-G, Section SP-8.6.

8.6.10 MEASUREMENT AND PAYMENT: Payment of the furnishing and installing of equipment will be made at the Lump Sum Price Bid of which the item is a part and shall be full compensation for all work in accordance therewith, complete and finished in accordance with the drawings and specifications.

SP-8-G. MANUFACTURER'S INSTALLATION CERTIFICATION FORM:

Contract No: _____ Specification section: _____

Equipment name: _____

Contractor: _____

Manufacturer of equipment item: _____

The undersigned manufacturer of the equipment item described above hereby certifies that he has checked the installation of the equipment and that the equipment, as specified in the project manual, has been provided in accordance with the manufacturer's recommendations, and that the trial operation of the equipment item has been satisfactory.

Comments: _____

Date

Manufacturer

Signature of Authorized Representative

Date

Contractor

Signature of Authorized Representative

SP-8-H. MANUFACTURER'S INSTRUCTION CERTIFICATION FORM:

Contract No: _____ Specification section: _____

Equipment name: _____

Contractor: _____

Manufacturer of equipment item: _____

The undersigned manufacturer certifies that a service engineer has instructed the wastewater treatment plant operating personnel in the proper maintenance and operation of the equipment designated herein.

Operations Check List (check appropriate spaces)	
Start-up procedure reviewed	
Shutdown procedure reviewed	
Normal operation procedure reviewed	
Others:	
Maintenance Check List (check appropriate spaces)	
Described normal oil changes (frequency)	
Described special tools required	
Described normal items to be reviewed for wear	
Described preventive maintenance instructions	
Described greasing frequency	
Others:	

Date

Manufacturer

Signature of Authorized Representative

Date

Signature of DOW's Representative

Date

Signature of Contractor's Representative

END OF SECTION

SECTION SP-8.7 – ARC FLASH HAZARD ANALYSIS AND SHORT CIRCUIT/ COORDINATION STUDY

8.7.01 DESCRIPTION AND REQUIREMENTS: Materials, equipment, and construction methods specified in other sections of the specifications for Electrical Work shall apply to this section.

A. This section specifies that the Contractor shall subcontract an independent full member NETA Engineering and Study Firm and Testing Firm to prepare and furnish, but not necessarily be limited to, the following:

- (1) Short-circuit study (SCS) and a protective device coordination study (PDCS) for all facility new and existing electrical distribution power system equipment.
- (2) Arc Flash Hazard Analysis Study (AFA) per the requirements set forth in the current version of NFPA 70E -Standard for Electrical Safety in the Workplace. The arc flash hazard analysis shall be performed according to the IEEE Standard 1584 - 2002, the IEEE Guide for Performing Arc-Flash Calculations.
- (3) The scope of the studies shall include all new distribution and power equipment supplied under this contract, temporary distribution and power equipment, and existing equipment, including, but not limited to, the following:
 - a. Existing utility transformer.
 - b. Existing equipment fed by the new equipment.
 - c. Existing equipment feeding new equipment.
- (4) Qualifications: The short-circuit, protective device coordination, and arc flash hazard analysis studies shall be performed by the manufacturer of the distribution and power equipment or by an electrical study or testing service that is regularly engaged in power system studies. The Hawai'i registered professional Electrical Engineer responsible for the studies shall affix the professional licensed electrical stamp (Hawai'i) and sign the studies.

B. APPLICABLE PUBLICATIONS: The publications listed below and/or listed herein shall form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only. Consider the advisory provisions to be mandatory, as though the word "shall" had been substituted for "should" wherever it appears. Equipment, materials, installation, and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70, unless more stringent requirements are specified or indicated.

- (1) Institute of Electrical and Electronics Engineers, Inc. (IEEE):
 - a. IEEE 141 - Recommended Practice for Electric Power Distribution and Coordination of Industrial and Commercial Power Systems.
 - b. IEEE 242 - Recommended Practice for Protection and Coordination of Industrial and Commercial Power Systems.

- c. IEEE 399 - Recommended Practice for Industrial and Commercial Power System Analysis.
- d. IEEE 241 - Recommended Practice for Electric Power Systems in Commercial Buildings.
- e. IEEE 1015 - Recommended Practice for Applying Low-Voltage Circuit Breakers Used in Industrial and Commercial Power Systems.
- f. IEEE 1584 - Guide for Performing Arc-Flash Hazard Calculations.

(2) American National Standards Institute (ANSI):

- a. ANSI C57.12.00 - Standard General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers.
- b. ANSI C37.13 - Standard for Low Voltage AC Power Circuit Breakers Used in Enclosures.
- c. ANSI C37.010 - Standard Application Guide for AC High Voltage Circuit Breakers Rated on a Symmetrical Current Basis.
- d. ANSI C 37.41 - Standard Design Tests for High Voltage Fuses, Distribution Enclosed Single-Pole Air Switches, Fuse Disconnecting Switches and Accessories.

(3) The National Fire Protection Association (NFPA)

- a. NFPA 70 - National Electrical Code, latest edition.
- b. NFPA 70E - Standard for Electrical Safety in the Workplace.

(4) National Electrical Testing Association (NETA)

- a. NETA ATS - Acceptance Testing Specifications for Electrical Power Distribution Equipment and Systems

C. SUBMITTALS: Submit a complete arc flash hazard analysis and short circuit/coordination study report, as specified herein, in accordance with Section SP-8.3, ELECTRICAL WORK - SUBMITTALS:

- (1) The studies shall be submitted prior to receiving final approval of the new distribution and power equipment shop drawings and/or prior to release of equipment drawings for manufacturing. If formal completion of the study may cause delays in equipment shipments, approval from DOW may be obtained for a preliminary submittal of data to ensure that the selection of device ratings and characteristics will be satisfactory to properly select the distribution and power equipment. The formal study will be provided to verify preliminary findings.

- (2) The results of the short-circuit, protective device coordination, and arc flash hazard analysis studies shall be summarized in a final report. Electronic PDF copies of the report shall be provided upon request.
- (3) The electronic files of the system model used to perform the study shall be submitted upon completion and acceptance of the study results by DOW.
- (4) The product shall be a certified report summarizing the short circuit and coordination study and conclusions or recommendations which may affect the integrity of the electric power distribution system. As a minimum, the report shall include the following sections:
 - a. Executive Summary including Introduction, Scope of Work and Results/Recommendations.
 - b. Short-Circuit Methodology Analysis Results and Recommendations.
 - c. Short-Circuit Device Evaluation Table.
 - d. Protective Device Coordination Methodology Analysis Results and Recommendations
 - e. Protective Device Settings Table.
 - f. Time-Current Coordination Graphs and Recommendations.
 - g. Arc Flash Hazard Methodology Analysis Results and Recommendations including the details of the incident energy and flash protection boundary calculations, along with Arc Flash boundary distances, working distances, Incident Energy levels and Personal Protection Equipment levels in accordance with the methods outlined in IEEE Standard 1584 and stated hereinafter.
 - h. Arc Flash Labeling section showing types of labels to be provided. Section will contain descriptive information as well as typical label images.
 - i. Work shall include the fabrication of signs with the arc flash hazard study results and the installation of the signs on the equipment in accordance with NFPA 70E Table 3-3.9.3 that includes the personnel protective equipment (PPE) risk category, the energy available, and the clothing recommendation.
 - j. One-line system diagram that shall be computer generated and will clearly identify individual equipment buses, bus numbers used in the short-circuit analysis, cable and bus connections between the equipment, calculated maximum short-circuit current at each bus location, device numbers used in the time-current coordination analysis, and other information pertinent to the computer analysis.
 - k. The equipment manufacturer's information used to prepare the study.
 - l. Power Utility Company system information applicable to the project.

- m. Short circuit calculations listing short circuit levels at each bus. Provide a sketch of the bus and use both the project term and the bus-code-name to identify the bus, branches, sources, loads. Base the system on the Project One-Line diagram.
- n. Coordination study time-current curves including the instrument transformer ratios, model numbers of the protective relays, and the relay settings associated with each breaker.
- o. Comparison of short circuit duties of each bus to the interrupting capacity of the equipment protecting that bus.
- p. Data used as input to the report that includes cable impedances, source impedances, equipment ratings for the equipment being purchased for the project, etc.
- q. Assumptions made during the study.

D. STUDIES: The Contractor shall furnish an Arc Flash Hazard Analysis Study per NFPA 70E -Standard for Electrical Safety in the Workplace, reference Article 130.3 and Annex D, as prepared by the subcontracted Study Firm. This study shall also include a short circuit and coordination study on the electrical power distribution system as specified and as described in Section 6.1 of NETA ATS. The studies shall be performed in accordance with IEEE Standards 141 and 242 and shall utilize the ANSI method of short circuit analysis in accordance with ANSI C37.010.

The studies shall be performed using actual equipment data for both existing and new equipment. For new equipment, the Contractor shall provide copies of final reviewed equipment submittals to the Study Firm upon request.

Any power distribution equipment outages shall be scheduled in advance and coordinated with DOW to limit process outages as required per plant process capacities.

E. DATA:

- (1) Contractor shall furnish all data as required for the power system studies. The Study Firm performing the short-circuit, protective device coordination, and arc flash hazard analysis studies shall furnish the Contractor with a listing of required data immediately after award of the contract. The Contractor shall expedite collection of the data to assure completion of the studies as required for final approval of the distribution and power equipment shop drawings and/or prior to the release of the equipment for manufacturing.
- (2) Source combination may include present and future motors.
- (3) Load data utilized may include existing and proposed loads obtained from Contract Documents.
- (4) If applicable, include fault contribution of existing motors in the study. The Contractor shall obtain required existing equipment data, if necessary, to satisfy the study requirements.

F. SHORT-CIRCUIT ANALYSIS:

- (1) Transformer design impedances shall be used when test impedances are not available.
- (2) Provide the following:
 - a. Calculation methods and assumptions.
 - b. Selected base per unit quantities.
 - c. One-line diagram of the system being evaluated that clearly identifies individual equipment buses, bus numbers used in the short-circuit analysis, cable and bus connections between the equipment, calculated maximum short-circuit current at each bus location and other information pertinent to the computer analysis.
 - d. The study shall include input circuit data including electric utility system characteristics, source impedance data, conductor lengths, number of conductors per phase, conductor impedance values, insulation types, transformer impedances and X/R ratios, motor contributions, and other circuit information as related to the short-circuit calculations.
 - e. Tabulations of calculated quantities including short-circuit currents, X/R ratios, equipment short-circuit interrupting or withstand current ratings and notes regarding adequacy or inadequacy of the equipment rating.
 - f. Results, conclusions, and recommendations. A comprehensive discussion section evaluating the adequacy or inadequacy of the equipment must be provided and include recommendations as appropriate for improvements to the system.
- (3) For solidly-grounded systems, provide a bolted line-to-ground fault current study for applicable buses as determined by the Engineer performing the study.
- (4) Protective Device Evaluation:
 - a. Evaluate equipment and protective devices and compare to short circuit ratings.
 - b. Adequacy of switchgear, motor control centers, and panelboard bus bars to withstand short-circuit stresses.
 - c. Provide written notification of any circuit protective devices improperly rated for the calculated available fault current.

G. PROTECTIVE DEVICE TIME-CURRENT COORDINATION ANALYSIS:

- (1) Protective device coordination time-current curves (TCC) shall be displayed on 5-cycle log-log scale graph paper.

- (2) Include on each TCC graph, a complete title with descriptive device names.
- (3) Terminate device characteristic curves at a point reflecting maximum symmetrical or asymmetrical fault current to which the device is exposed.
- (4) Identify the device associated with each curve by manufacturer type, function, and, if applicable, tap, time delay, and instantaneous settings recommended.
- (5) Plot the following characteristics on the TCC graphs, where applicable:
 - a. Electric utility's overcurrent protective device.
 - b. Medium voltage equipment overcurrent relays.
 - c. Medium and low voltage fuses including manufacturer's minimum melt, total clearing, tolerance, and damage bands.
 - d. Low voltage equipment circuit breaker trip devices, including manufacturer's tolerance bands.
 - e. Transformer full-load current, magnetizing inrush current, and ANSI through-fault protection curves.
 - f. Medium voltage conductor damage curves.
 - g. Ground fault protective devices, as applicable.
 - h. Pertinent motor starting characteristics and motor damage points, where applicable.
 - i. The largest feeder circuit breaker in each motor control center and applicable panelboard.
- (6) Provide adequate time margins between device characteristics such that selective operation *is* provided, while providing proper protection.
- (7) Provide the following:
 - a. A One-line diagram shall be provided which clearly identifies individual equipment buses, bus numbers, device identification numbers and the maximum available short-circuit current at each bus when known.
 - b. A sufficient number of log-log plots shall be provided to indicate the degree of system protection and coordination by displaying the time-current characteristics of series connected overcurrent devices and other pertinent system parameters.
 - c. Computer printouts shall accompany the log-log plots and will contain descriptions for each of the devices shown, settings of the adjustable devices,

and device identification numbers to aid in locating the devices on the log-log plots and the system one-line diagram.

- d. The study shall include a separate, tabular printout containing the recommended settings of all adjustable overcurrent protective devices, the equipment designation where the device is located, and the device number corresponding to the device on the system one-line diagram.
- e. A discussion section which evaluates the degree of system protection and service continuity with overcurrent devices, along with recommendations as required for addressing system protection or device coordination deficiencies.
- f. Provide written notification of any significant deficiencies in protection and/or coordination. Provide recommendations for improvements.

H. ARC FLASH HAZARD ANALYSIS:

- (1) The arc flash hazard analysis shall be performed according to the IEEE 1584 equations that are presented in NFPA 70E, Annex D. The arc flash hazard analysis shall be performed in conjunction with the short-circuit analysis and the protective device time-current coordination analysis.
- (2) The flash protection boundary and the incident energy shall be calculated at significant locations in the electrical distribution system (switchboards, switchgear, motor control centers, panelboards, busway and splitters) where work could be performed on energized parts.
- (3) Working distances shall be based on IEEE 1584. The calculated arc flash protection boundary shall be determined using those working distances.
- (4) When appropriate, the short circuit calculations and the clearing times of the phase overcurrent devices will be retrieved from the short-circuit and coordination study model. Ground overcurrent relays should not be taken into consideration when determining the clearing time when performing incident energy calculations.
- (5) The short-circuit calculations and the corresponding incident energy calculations for multiple system scenarios must be compared and the greatest incident energy must be uniquely reported for each equipment location in a single table. Calculations must be performed to represent the maximum and minimum contributions of fault current magnitude for normal and emergency operating conditions. The minimum calculation will assume that the utility contribution is at a minimum. Conversely, the maximum calculation will assume a maximum contribution from the utility. Calculations shall take into consideration the parallel operation of synchronous generators with the electric utility, where applicable as well as any stand-by generator applications.

The Arc Flash Hazard Analysis shall be performed utilizing mutually agreed upon facility operational conditions, and the final report shall describe, when applicable, how these conditions differ from worst case bolted fault conditions.

- (6) The incident energy calculations must consider the accumulation of energy over time when performing arc flash calculations on buses with multiple sources. Iterative calculations must take into account the changing current contributions, as the sources are interrupted or decremented with time. Fault contribution from motors should be decremented as follows:

Fault contribution from induction motors should not be considered beyond 5 cycles.

- (7) For each piece of ANSI rated equipment with an enclosed main device, two calculations shall be made. A calculation shall be made for the main cubicle, sides, or rear; and shall be based on a device located upstream of the equipment to clear the arcing fault. A second calculation shall be made for the front cubicles and shall be based on the equipment's main device to clear the arcing fault. For all other non-ANSI rated equipment, only one calculation shall be required and it shall be based on a device located upstream of the equipment to clear the arcing fault.
- (8) When performing incident energy calculations on the line side of a main breaker (as required per above), the line side and load side contributions must be included in the fault calculation.
- (9) Miscoordination should be checked amongst all devices within the branch containing the immediate protective device upstream of the calculation location and the calculation should utilize the fastest device to compute the incident energy for the corresponding location.
- (10) Arc Flash calculations shall be based on actual overcurrent protective device clearing time. A maximum clearing time of 2 seconds will be used based on IEEE 1584-2002 section 8.1.2. Where it is not physically possible to move outside of the flash protection boundary in less than 2 seconds during an arc flash event, a maximum clearing time based on the specific location shall be utilized.
- (11) Provide the following:
 - a. Results of the Arc-Flash Hazard Analysis shall be submitted in tabular form, and shall include device or bus name, bolted fault and arcing fault current levels, flash protection boundary distances, working distances, personal-protective equipment classes and AFIE (Arc Flash Incident Energy) levels.
 - b. The Arc-Flash Hazard Analysis shall report incident energy values based on recommended device settings for equipment within the scope of the study.
 - c. The Arc-Flash Hazard Analysis may include recommendations to reduce AFIE levels and enhance worker safety.

I. EXECUTION:

(1) Field Adjustment:

- a. Contractor shall adjust relay and protective device settings according to the recommended settings table provided by the coordination study.

- b. Contractor shall make minor modifications to equipment as required to accomplish conformance with short circuit and protective device coordination studies.
- c. Provide written notification of any required major equipment modifications.

(2) Arc Flash Labels:

- a. Provide a 4-inch x 4-inch, Brady thermal transfer type label of high adhesion polyester for each work location analyzed.
- b. The labels shall be designed according to the following standards:
 - 1) UL969 – Standard for Marking and Labeling Systems.
 - 2) ANSI z535.4 – Product Safety Signs and Labels.
 - 3) NFPA 70 (National Electric Code – Article 110.16.(5) Limited, restricted, and prohibited
- c. The label shall include the following information:
 - 1) System Voltage.
 - 2) Flash protection boundary.
 - 3) Personal Protective Equipment Category.
 - 4) Arc Flash Incident energy value (cal/cm²)
 - 5) Limited, restricted, and prohibited Approach Boundaries.
 - 6) Study report number and issue date.
- d. Labels shall be printed by a thermal transfer type printer, with no field markings.
- e. Arc flash labels shall be provided for equipment as identified in the study and the respective equipment access areas per the following:
 - 1) Floor Standing Equipment – Labels shall be provided on the front of each individual section. Equipment requiring rear and/or side access shall have labels provided on each individual section access area. Equipment line-ups containing sections with multiple incident energy and flash protection boundaries shall be labeled as identified in the Arc Flash Analysis table.
 - 2) Wall Mounted Equipment – Labels shall be provided on the front cover or a nearby adjacent surface, depending upon equipment configuration.
 - 3) General Use Safety labels shall be installed on equipment in coordination with the Arc Flash labels. The General Use Safety labels shall warn of general electrical hazards associated with shock, arc flash, and explosions,

and instruct workers to turn off power prior to work.

(3) Implementing PDCS Settings and Arc Flash Sign Installation:

- a. The Testing Firm shall implement the protective device coordination study settings on new and existing equipment, as required in Section SP-7.1, based on the Study Firm's Protective Device Coordination Report specified herein and accepted by DOW, and submit a final amended report of the Record As-Built electrical equipment protective device settings subsequent to start-up and testing.
- b. The Testing Firm shall work with the Contractor and the Study Firm for implementing the Arc Flash Hazard sign installation requirements for electrical equipment as specified in NEC Article 110.16 Flash Protection and NFPA 70E.

8.7.02 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-8.8 LIGHTING

8.8.01 DESCRIPTION: This section specifies luminaires (lighting fixtures) features and installation and applies to the installation of new indoor and outdoor lighting.

8.8.02 REFERENCES:

- A. This section contains references to the following documents. They are a part of this section as specified and modified. Where a referenced document contains references to other standards, those documents are included as references under this section as if referenced directly. In the event of conflict between the requirements of this section and those of the listed documents, the requirements of this section shall prevail.
- B. Unless otherwise specified, references to documents shall mean the documents in effect at the time of Advertisement for Bids or Invitation to Bid (or on the effective date of the Agreement if there were no Bids). If referenced documents have been discontinued by the issuing organization, references to those documents shall mean the replacement documents issued or otherwise identified by that organization or, if there are no replacement documents, the last version of the document before it was discontinued. Where document dates are given in the following listing, references to those documents shall mean the specific document version associated with that date, regardless of whether the document has been superseded by a version with a later date, discontinued or replaced.

Reference	Title
NFPA 70	National Electrical Code (NEC)

8.8.03 WARRANTY: LED Luminaires and Lamps Warranty. Provide five-year limited warranty.

8.8.04 SUBMITTALS: List of materials and components with arrangement drawings. Refer to Drawings for fixture schedule.

8.8.04 LIGHTING MATERIALS: Lighting materials, including luminaires, lamps, accessories, and hardware, shall conform to the detailed requirements specified on the drawings.

8.8.05 EXTERIOR LUMINAIRES:

- A. Complying with UL 1598 and listed for installation in wet locations.
 - (1) Sheet Metal Components: Corrosion-resistant aluminum with powder-coat finish, unless otherwise indicated. Formed and supported to prevent warping and sagging.
 - (2) Housings: Housings shall not warp, sag, or deform in use and shall be rigidly formed, weather- and light-tight enclosures. Provide filter/breather for enclosed luminaires.
 - (3) Doors, Frames, and Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Removable

doors for cleaning or replacing lenses. Designed to disconnect ballast when door opens.

- (4) Exposed Hardware Material: Stainless steel.
- (5) Plastic Parts: High resistance to yellowing and physical changes due to aging, exposure to heat, and UV radiation.
- (6) Lenses and Refractors Gaskets: Provide heat-resistant and aging-resistant resilient gaskets to seal and cushion lenses and refractors in luminaire doors.

8.8.06 LED ELECTRONIC DRIVER: Drivers shall incorporate internal fusing designed to withstand a 2.5kV surge test and shall be Class 1 rated for 120V with an operating temperature of -20 deg F to 140 deg F. Drivers shall have power factor better than 90% and total harmonic distortion less than 20%. Expected lifetime of driver shall be 100,000 hours or greater.

8.8.07 LED LIGHT ENGINES AND OPTICS:

- A. LED light engines shall consist of multiple LED arrays mounted to a metal-core circuit board with heat sink to improve thermal management.
- B. LED lamps shall utilize acrylic lenses with multiple photometric distributions available.
- C. LED lamp color temperatures shall be from 3000K to 5000K.

8.8.08 FIXTURE FINISHES:

- A. Manufacturer standard unless scheduled or shown:
 - (1) Paint Finish: Applied over corrosion-resistant treatment or primer, free of defects.
 - (2) Metallic Finish: Corrosion resistant.
 - (3) Color: Dark bronze.

8.8.09 PHOTOELECTRIC RELAYS:

- A. PHOTO-CELLS:
 - (1) Provide UL 773 or UL 773A listed units. Factory-mount units to the luminaires. Where available, provide units from the same manufacturer as the fixture.
 - (2) Provide time-delay relays that fail in the on-position, factory set to turn light unit on at 1.5 to 3 foot candles (16 to 32 lux) and off at 4.5 to 10 foot candles (48 to 108 lux) with 15-second minimum time delay. Provide directional lens in front of photocell to prevent fixed light sources to cause turnoff.
 - (3) Provide a cadmium sulfide cell housed in a plug receptacle assembly, three-prong, polarized, locking type. Provide assembly for outdoor mounting and rated for 1800 VA at 120V maximum capacity.

- a. Relay with locking-type receptacle shall comply with NEMA C136.10.
- b. Adjustable window slide for adjusting on-off set points.

8.8.10 EXECUTION:

- A. The location and type of luminaires, associated poles, fixtures, and receptacles are as shown on the drawings.
- B. Labels and marks, except the UL label, shall be removed from exposed parts of the fixtures. Fixtures shall be cleaned when the project is ready for acceptance.
- C. Raceways, wire, or cable shall be provided in accordance with SP-7. Raceways and wire shall be provided from the fixtures, switches and receptacles to the lighting panel in accordance with the NEC. Underground and outdoor wire splices shall be in accordance with Section SP-7.
- D. Fixtures labeled to require conductors with a temperature rating exceeding 75 degrees C shall be spliced to circuit conductors in a separately mounted junction box. Fixture wire shall meet UL and NEC requirements. Fixture shall be connected to junction box using flexible conduit with a temperature rating equal to that of the fixture.
- E. Recessed fixtures shall be provided with mounting hardware for the ceiling system specified. A concealed latch and hinge mechanism shall be provided to permit access to the lamps and ballasts and for removal and replacement of the diffuser without removing the fixture from ceiling panels.
- F. Fixtures shall be aligned and directed to illuminate an area as specified. Fixtures shall be directly and rigidly mounted on their supporting structures. The conduit system shall not be used to support fixtures.
- G. Fixture supports that are welded to steel members shall be treated with rust-resistant primer and finish paint where brackets or supports for lighting fixtures.
- H. Provide manufacturer recommended mounting hardware and brackets.

8.8.11 WIRE CONNECTIONS: Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values or use torque values specified in UL 486A and UL 486B.

8.8.12 FIELD QUALITY CONTROL:

- A. Inspect each installed fixture for damage then replace damaged fixtures and components. Verify normal operation of each fixture after installation.
- B. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation.

Verify normal transfer to battery power source and retransfer to normal.

- C. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. Retest to demonstrate compliance with specification requirements where adjustments are made. Replace fixtures with damage or corrosion during warranty period.

8.8.13 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-9 CIVIL SITE WORK

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9.0	CIVIL SITE WORK

SECTION SP-9 – CIVIL SITE WORK

9.01 GENERAL:

- A. This section covers the requirements for performing site work to include, but is not limited to, erosion and dust control, asphalt concrete pavement demolition and removal, building and trenching excavation and fill, installation of new asphalt concrete pavement and associated concrete headers and curbs, installation of bollards, and site grading and restoration.
- B. This item of work shall include the furnishing of all labor, materials, tools and equipment necessary for completing this item of work as specified in DIVISION 300 – *CONSTRUCTION*, SECTION 303.02 *SITEWORK* of the *Water System Standards*, dated 2002 as amended, of the Department of Water, County of Kaua‘i; *Standard Specifications for Road and Bridge Construction*, dated 2005 as amended, of the Department of Transportation, State of Hawai‘i; and *Standard Details for Public Works Construction*, dated September 1984 as amended, of the Department of Public Works, County of Kaua‘i, as amended and as modified or supplemented hereinafter, and as applicable to this Project.
- C. The Contractor shall be responsible for coordinating all phases of the project with the DOW.
- D. All submittals shall be in accordance with Sections 1.6, 1.17, and the Water Construction Notes.

9.02 FIELD VERIFICATION:

- A. It shall be the responsibility of the Contractor to examine the Project site and determine for himself/herself the existing conditions. The existing site condition as of the bid opening date will be accepted as part of the work whether indicated on the Plans and/or described herein or that may vary therefrom.
- B. Dimensions and locations used in the composition of the Contract Documents are based on record drawings and are approximate. It is the responsibility of the Contractor to field-verify all dimensions, locations and clearances for new structures, equipment and appurtenances prior to their acquisition.

9.03 EROSION AND SEDIMENT CONTROL:

- A. The installation and maintenance of temporary erosion and sediment control measures shall occur in accordance with Ordinance No. 808 of the County of Kaua‘i; the “*Best Management Practices (BMP’s) for Sediment and Erosion Control*,” Department of Public Works, County of Kaua‘i, 2011 as amended; the “*Storm Water Runoff System Manual*,” Department of Public Works, County of Kaua‘i, July 2001 as amended, and the Construction Drawings.

9.04 CLEARING AND GRUBBING:

- A. Clearing shall consist of removing all obstructions, including rocks, debris, and vegetation, including brush, roots, stumps, and logs, occurring within the areas to be disturbed.

- B. Grubbing shall consist of the removal and disposal of any roots larger than three (3) inches in diameter and matted roots from all areas disturbed by Project work and proposed utility trenches within the approximate trenching limits. Excavate this material together with logs, organic and metallic debris, brush and refuse, and remove to a depth of not less than the finished subgrade elevation indicated on the plans as construction areas under this Contract.
- C. All vegetation, debris and other unsuitable materials resulting from clearing and grubbing operations shall be removed and disposed of offsite. Offsite disposal of unsuitable materials shall be in accordance with Federal, State and local regulations and as directed by the DOW. Burning will not be permitted.
- D. The Contractor shall take appropriate action to check and prevent the spread of dust and comply with all dust regulations imposed by the State and County of Kaua'i agencies.

9.05 DEMOLITION AND REMOVAL WORK:

- A. The DOW assumes no responsibility for the actual condition of items or portions of structures to be removed.
- B. The storage or sale of removed items on site will not be permitted.
- C. PROTECTION: Provide barricades, warning signs and lighting, and other forms of protection and maintenance and supervision thereof, or as may be directed as required to protect the users from injury due to selective removal work and to maintain security
 - (1) Provide interior and exterior shoring, bracing, or support to prevent movement, settlement, or collapse of structure or elements to be removed, and adjacent facilities or work to remain.
 - (2) Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.
- D. Promptly repair damages caused to adjacent facilities.
- E. Use of explosives will not be permitted.
- F. All materials resulting from removal work shall become property of the Contractor and shall be removed from the limits of the project site. Remove rubbish and debris from the jobsite daily, unless otherwise directed; do not allow accumulations inside or outside any buildings. Transport and legally dispose of materials off site. Remove and transport debris and rubbish in a manner that will prevent spillage on streets or adjacent areas. The Contractor shall comply with all applicable government regulations in disposing of said waste material. If hazardous materials are encountered during demolition operations, comply with applicable State, Federal and local regulations, laws, and ordinances concerning removal, handling, and protection against exposure or environmental pollution.
- G. Burning of removed materials is not permitted on the project site.

9.05 EARTHWORK

- A. Excavation, embankment, subgrade preparation, fill, compaction and grading shall comply with the Ordinances of the County of Kaua‘i, as amended; the “*Geotechnical Investigation Kilauea Wells Generator Shelter Kauai Department of Water Kilauea, Kauai, Hawaii,*” July 2017, prepared by Hirata & Associates, Inc.; and as specified herein.
- B. SUBMITTALS FOR FILL MATERIALS:
- (1) Submit the name of the proposed testing laboratory together with the qualifications of the person or persons who will be performing on site testing.
 - (2) Samples of fill materials to be used shall be submitted twenty (20) working days in advance of use. Samples shall consist of 0.5 cubic feet of each type of material, and shall be tagged with the name of the source and pit number where applicable.
 - (3) Test Results on Imported Materials: Provide copies of laboratory test reports demonstrating that the proposed imported materials meet the specification requirements. Test reports shall be dated no more than ninety (90) days prior to the date of submission. Submit maximum modified proctor densities and the optimum water content for all imported materials.
 - (4) Laboratory tests along with samples provided by the Contractor certifying:
 - a. Moisture density relationships.
 - b. Gradation test reports.
 - c. Gradation test for noncohesive materials.
 - d. Atterberg Limits (Plasticity Index) test results.
 - (5) Field testing reports.
- C. Provide and install shoring, cribbing, and lagging as required to safely preserve the excavations and earth banks from damages resulting from the work.
- D. The Contractor shall at all times control the grading around building areas so that the ground is adequately sloped to prevent any water from flowing into building areas and open trench excavations. All excavations shall be kept free from standing water, and the Contractor shall do all pumping and draining that may be necessary to remove water to the extent required in carrying on the work.
- E. Caution shall be exercised on all excavation work adjacent to existing trees that are to remain. All exposed fibrous and branch type roots shall be carefully pruned or saw-cut to the extent required for excavation work. Every effort shall be taken to preserve the existing trees and to minimize damage to said trees.

- F. The Contractor shall use best management practices to reduce the amount of soil erosion resulting from the grading work.
- G. Filling operations shall be performed so as to bring the fill area to the finished grades shown on the Drawings, allowing for topsoil, concrete slab, or site paving and base course.
- H. Soft or loose soils that do not readily compact should be excavated and replaced with compacted structural fill at no extra cost to DOW.
- I. When moisture content of the fill material is below optimum, water shall be added until the moisture content is optimum to ensure that the proper compaction can be obtained. When the moisture content of the fill material is above optimum, the fill material shall be aerated until the optimum moisture content is obtained.
- J. All cut and fill slopes shall be grassed by hydromulching or protected from erosion by other approved methods immediately upon their completion.

9.07 EXCAVATION AND FILL MATERIALS:

- A. For building slabs-on-grade, the exposed subgrade shall be scarified to a minimum depth of six (6) inches, moisture conditioned to about two (2) percent above optimum moisture, and compacted to a minimum 90 percent compaction as determined by ASTM D 1557.

As a precautionary measure, the relatively moist condition of the prepared subgrade shall be maintained prior to placement of fill materials. It is important that the soils not be allowed to dry significantly prior to placement of the overlying fill.

- B. Excavations – Excavation into the onsite silty clay can generally be accomplished using conventional excavating equipment. Temporary cuts into the near surface soils shall be stable at slope gradients of 1H:1V or flatter. It will be the Contractor’s responsibility to conform to all OSHA safety standards for excavations.
- C. The excavation areas that were overexcavated shall be backfilled with suitable fill material conforming to the requirements of these specifications and recompacted to a minimum 90 percent compaction in accordance with ASTM D 1557.
- D. Bottoms of excavations shall be compacted before placing fill materials.
- E. Onsite Fill Material – The onsite silty clay (if any) will be acceptable for reuse in compacted fills and backfills. All rock fragments larger than 3 inches in maximum dimension should be removed from the onsite clayey silt prior to reuse.
- F. Imported Fill Material – Imported fill material or granular structural fill shall be well-graded, non-expansive granular material. The imported fill material shall have a maximum particle size of 3 inches, and between 8 and 20 percent of soil by weight shall pass the #200 sieve. The plasticity index (P.I.) of the portion of the soil passing the #40 sieve shall not be greater than 10. It shall have a minimum CBR value of 15 and a CBR expansion value less than 1.0 percent when tested in accordance with ASTM D 1883. Any imported fill material shall be tested Contractor-hired Soils Engineer and approved by DOW prior to delivery to the Project site.

- G. Select Borrow – Select borrow shall be either onsite fill material or imported fill material that has a minimum CBR of 30.
- H. Compaction – Cohesive soils, such as the onsite silty clay, shall be placed in horizontal lifts restricted to eight (8) inches loose thickness and compacted to a minimum 90 percent compaction as determined by ASTM D 1557. Granular fill, such as imported fill material, shall be placed in horizontal lifts restricted to eight (8) inches in loose thickness, but compacted to a minimum 95 percent compaction as determined by ASTM D 1557. For exterior slabs-on-grade, concrete walkways, and asphalt concrete pavement, the base course should be compacted to a minimum 95 percent compaction as determined by ASTM D 1557.
- I. Fill placed in areas with slope steeper than 5H:1V should be continually benched as the fill is brought up in lifts.
- J. For geotechnical monitoring and testing requirements, see Section SP-10. As a minimum, the Contractor shall perform one (1) field in-place density test per 1,000 square feet, or fraction thereof, of each lift of fill or backfill areas compacted by either hand-operated machines or other than hand-operated machines. Field in-place density shall be determined in accordance with ASTM D 2922. Should test results indicate that compaction is not as specified; the material shall be removed, replaced, and recompacted to meet Specifications at the Contractor's expense.

9.08 TRENCH EXCAVATION:

- A. The bottom of trench shall be carried to the specified lines and grades with proper allowance for pipe thickness, concrete encasement, and for cushion as specified in the Plans, and Section SP 8 – ELECTRICAL WORK, of these Specifications.
- B. The Contractor shall not proceed with backfill placement in excavated areas until the subgrade has been inspected by the DOW. All pipes and concrete encasement shall have a minimum thickness of cushion material below the barrel of the pipe/conduit as specified in the Plans, and Section SP 8 – ELECTRICAL WORK, of these Specifications. Cushion material shall be placed in the bottom of the trench, leveled and compacted to 90 to 95 percent relative compaction in accordance with ASTM D 1557. Bell holes shall be excavated at each pipe/conduit joint to permit proper inspection and uniform bearing of pipe/conduit on cushion material.
- C. After the pipe/conduit has been laid to alignment and grade, unless otherwise specified, additional cushion material shall be placed in layers the full width of the trench and compacted up to the specified level. Cushion shall be placed simultaneously on both sides of the pipe/conduit, keeping the level of backfill the same on each side. The material shall be carefully placed and compacted around the pipe/conduit to ensure that the pipe/conduit barrel is completely supported and that no voids or uncompacted areas are left beneath the pipe/conduit. The Contractor shall use particular care in placing material on the underside of the pipe/conduit to prevent lateral movement during backfilling.

- D. The trench shall be backfilled to an elevation which will permit the placement of the specified surface. Other surfaces shall be restored, including compaction, to the condition existing prior to construction.
 - E. See Section SP-10 for geotechnical monitoring and testing.
- 9.09 GEOTEXTILE MATERIAL: Soil separation and stabilization geosynthetic fabric shall be a non-woven geotextile, Tencate 170N or approved equal. Submit manufacturer's literature and sample of the geotextile fabric at least two (2) weeks prior to use.
- 9.10 SURVEY LAYOUT: The Contractor shall employ a Hawai'i-licensed Land Surveyor to determine lines and elevations. The Contractor shall layout lines and grades from existing property lines and benchmarks and shall assume responsibility for their accuracy for use during construction. The Contractor shall preserve and maintain all benchmarks and survey reference points previously established by the DOW. If any benchmarks or survey reference points are disturbed, damaged, or removed due to construction activities, the Contractor is responsible for restoration under the Hawai'i-licensed land surveyor's direction and approval. Copies of field notes, descriptions, and new values of the new benchmark shall be sent to the Department of Public Works and all applicable agencies for review and approval prior to final acceptance of the project.
- 9.11 ORDINANCES, REGULATIONS: All work shall conform to the following ordinances and regulations:
- A. Section 22-7.17 – *Specifications for Grading, Grubbing, and Stockpiling* – Kaua'i County Code, 1987, as amended (Ordinance No. 1016).
 - B. Public Health Regulations, HAR Title 11, Chapter 54 - *WATER QUALITY STANDARDS*
 - C. Public Health Regulations, HAR Title 11, Chapter 55 - *WATER POLLUTION CONTROL*
 - D. Public Health Regulations, HAR Title 11, Chapter 60 - *AIR POLLUTION CONTROL*
 - E. Public Health Regulations, HAR Title 11, Chapter 46 - *COMMUNITY NOISE CONTROL*
 - F. Public Health Regulations, NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
 - G. *Storm Water Runoff System Manual*, by the Department of Public Works, County of Kauai, dated July 2001
- 9.12 CONSTRUCTION AREA APPEARANCE:
- A. GENERAL: The Contractor shall, throughout the duration of the Project, keep all roadways free from all debris produced from the Project. The Contractor shall keep the Project and surrounding area neat and free from dust nuisance. The DOW may require supplementary measures as necessary. Upon completion of each phase of the Project, the Contractor shall immediately remove all excess material and thoroughly clean the affected area.

- B. COMPLETION OF WORK: Upon completion of the work, the Contractor shall remove all equipment, signs and unused materials provided for the work and shall restore the Project site to a neat and clean condition and do all the other required cleaning as specified above and by DOW.
- C. NON-COMPLIANCE: Should the Contractor fail to comply with the foregoing provisions, DOW may, with or without notice, cause the cleaning to be done and deduct the cost of such work from any moneys due the Contractor under this contract.

9.13 EXISTING UTILITIES:

- A. This section shall supplement Division 200 - *Earthwork*, of the *Hawaii Standard Specifications for Road and Bridge Construction*, dated 2005, of the Department of Transportation, Highway Division, State of Hawai'i, as amended.
- B. Prior to commencing excavation, the Contractor shall exercise due diligence in locating and protecting any utilities. The Contractor shall be responsible for and shall pay for all damages to existing utilities. DOW will not be responsible for damages to the Contractor's equipment resulting from any conflicts with existing utilities.
- C. The Contractor shall be responsible for the protection of existing surface and subsurface utilities and poles within and abutting the Project site, trench excavations, borrow sites and other work areas. Any utilities that the Contractor encounters during the progress of the work, such as, telephone ducts, electric ducts, water lines, sewer lines, electric lines and drainage pipes, whether or not shown on the Plans, shall not be disturbed or damaged unless otherwise instructed in the Plans and Specifications. The Contractor shall notify the DOW and the affected utility company immediately of any damaged or disturbed utility.
- D. The Contractor shall be responsible for and shall pay for all damages to existing utilities whether shown or not shown on the Plans.

9.14 ASPHALT CONCRETE PAVEMENT:

- A. REFERENCES: All materials, storage, handling, and installation shall be in accordance with the following. If references or standards conflict, the more stringent standard shall be used unless otherwise determined by DOW.
 - (1) *Geotechnical Investigation Haena 0.2 MG Water Storage Tank, Haena-Wainiha Water System, Wainiha, Kauai*, July 10, 2017 by Hirata and Associates, Inc.
 - (2) Chapter 303 of the *Water System Standards*, 2002 as amended, County of Kaua'i
 - (3) *Standard Specifications for Public Works*, 1986 as amended, County of Kaua'i
 - (4) *Standard Specifications for Road and Bridge Construction*, 2005 as amended, of the Hawai'i State Department of Transportation
- B. SUBMITTALS:

- (1) Manufacturer's certificates of conformance for bituminous material and for the job mix formula to the DOW for approval.
- (2) Test results (certified degree of compaction, moisture content, gradation tests) of subgrade and aggregates to be used two (2) weeks in advance of use for approval

C. JOB CONDITIONS:

- (1) Construct only when temperatures are above minimum specified in *the Standard Specifications for Road and Bridge Construction, 2005* as amended, Hawai'i State Department of Transportation.
- (2) Do not construct pavement or base when the base surface is wet or contains an excess of moisture which would prevent uniform distribution and the required penetration.
- (3) Establish and maintain the required lines and grades for each course during construction operations.
- (4) Maintain vehicular and pedestrian traffic during paving operations, as required for other construction activities and in accordance with Drawings.

D. ROAD RESTORATION REQUIREMENTS

- (1) The Contractor's responsibility as to road restoration shall include, but not be limited to, proper backfill and compaction of excavation, shaping and general restoration of the pavement, restoration of public and private improvements when damaged by construction, restoration of drainage facilities, scarification of existing surfacing, if required, removal of debris and surplus of material, and all other requirements of these Specifications.
- (2) New manhole rings and valve boxes and monument cases shall be adjusted as necessary to be flush with the restored surface, and shall be done to the satisfaction and current standards of the road Agency having jurisdiction.
- (3) Place asphaltic concrete at line and grade to match existing manhole rings, valve boxes, and monument cases, unless noted otherwise on the plans.
- (4) The Contractor shall restore any existing improvements within Project vicinity including, but not limited to, culverts, driveways, curbs, walkways, road markings, parking strips, pavement markings, parking areas, signs, or other permanent improvements. Restoration shall be in accordance with the current standards of the road Agency having jurisdiction.
- (5) Any settlement which occurs during the first year after final Contract acceptance shall be repaired by the Contractor at his expense.

- E. The pavement section should consist of two (2) inches of Asphalt Concrete Paving (ACP) over six (6) inches of untreated aggregate base course, over six (6) inches of select borrow aggregate subbase, over six (6) inches of borrow, placed on the compacted subgrade. The six (6) inches of borrow may be replaced with an additional four (4) inches of aggregate

subbase if desirable. Prime or tack coat should be applied per the standards and the Drawings.

- F. Relative compaction shall be at least 95 percent as determined by ASTM D1557.
- G. The subgrade should be compacted to at least 95 percent relative compaction for a minimum depth of at least six (6) inches. Soil tests shall be made at the subgrade level and the final pavement structure verified or modified as necessary.
- H. Apply pre-paving herbicide to all new pavement areas in accordance with the manufacturer's recommended procedures and rates. Application shall not be made immediately after heavy rains or when rain is forecasted within the next 48 hours. Perform two herbicide applications at least three days apart.
- I. The finished surface of the pavement shall be true to grade and cross sections, free from depressions and grainy spots; and of uniform texture. It shall not vary more than 1/8 of an inch over 10 feet. Low or defective areas shall be corrected by cutting out the faulty areas and replacing with new materials. Skin patching for correcting low areas will not be permitted.

9.15 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-10 GEOTECHNICAL WORK

TABLE OF CONTENTS FOR SECTION SP-10

<u>SECTION</u>	<u>DESCRIPTION</u>
10.0	GEOTECHNICAL MONITORING AND TESTING

SECTION SP-10 – GEOTECHNICAL MONITORING AND TESTING

- 10.01 GENERAL: Contractor shall retain the services of a licensed geotechnical engineer to monitor the quality, installation and compaction of all pipe cushion, trench backfill, and structural backfill material per Section SP-9 and all applicable sections of this Request for Proposal and approved Construction Drawings. Department of Water will require periodic sieve testing of the pipe cushion and backfill material during the course of construction as the Chief of Construction Management deems necessary. Results of all Geotechnical engineer's testing (sieve analysis and compaction results) shall be provided to the Department of Water within seven (7) calendar days of sampling and testing.

Contractor shall retain the services of a licensed Geotechnical engineer as stated in the notes of the approved construction drawings to monitor the quality and compaction of material during installation of the building foundation, drainage facilities, all underground utilities, parking lot, driveway, sidewalks, miscellaneous paving of asphalt cement and concrete, and appurtenances as required by the various sections of the associated Request for Proposal documents.

The Geotechnical engineer's representative shall be on-site at ALL times where and when backfill occurs within the project site to assure quality of backfill, proper compaction, and other requirements necessary for the project.

Contractor shall be responsible for all associated costs for the licensed Geotechnical engineer monitoring and testing required by the approved construction drawings, specifications, and other related documents referenced in this Solicitation Document.

- 10.02 MEASUREMENT AND PAYMENT: Payment for the furnishing and installing of material, equipment, incidentals and all work included in this Section shall be made at the unit price item or the lump sum item indicated in the Proposal, whichever is specified, and shall be full compensation for all work in connection therewith, complete and finished in accordance with the drawings and specifications.

END OF SECTION

SECTION SP-11 FIELD OFFICE

TABLE OF CONTENTS FOR SECTION SP-11

<u>SECTION</u>	<u>DESCRIPTION</u>
11.0	FIELD OFFICE

SECTION SP-11 – FIELD OFFICE

- 11.01 GENERAL: A field office is required for this project. It shall be furnished per section 6.3 of the General Provisions for Construction Contracts with the Department of Water. Contractor shall be responsible for all associated costs for the field office.
- 11.02 MEASUREMENT AND PAYMENT: Unless otherwise specified, payment for field office shall not be measured nor paid for directly but shall be considered incidental to the construction work.

END OF SECTION

NOTICE OF INTENT

DATE

Chief Procurement Officer
Department of Water
County of Kaua'i
4398 Pua Loke Street
Līhu'e, HI 96766

Dear Sir:

In accordance with the Provisions of Section 103D-310, Hawai'i Revised Statutes, you are hereby notified that it is the intent of the undersigned to offer on **JOB NO. 16-04, Water Plan 2020 #WKK-03, MCC, Chlorination Facilities – Kilauea Wells No. 1 and No. 2, KAUA'I, HAWAI'I**, for which Offers will be due on **Friday, June 5, 2020** as required.

I am informed that this Notice of Intent must be received by the CPO no later than 4:30 p.m. Hawai'i Standard Time on **Tuesday, May 26, 2020**.

VERY TRULY YOURS,

SIGNATURE

PRINT OR TYPE NAME & TITLE OF SIGNER

Hawai'i State Specialty License
Type and Classification:

NAME OF FIRM

CONTRACTORS LICENSE NO.

Hawai'i State Business
License No.:

ADDRESS

CITY, STATE & ZIP CODE

TELEPHONE NO.



All prospective offerors must be currently licensed by the Hawai'i Department of Commerce and Consumer Affairs, Division of Professional and Vocational Licensing.

"A" general engineering contractors and "B" general building contractors are reminded that due to the Hawai'i Supreme Court's January 28, 2002 decision in Okada Trucking Co., Ltd. v. Board of Water Supply, et al., 97 Haw. 450(2002), they are prohibited from undertaking any work, solely or as part of a larger project, which would require the general contractor to act as a specialty contractor in any area where the general contractor has no license. Although the "A" and "B" contractor may still submit a Offer on and act as the "prime" contractor on an "A" or "B" project (See, HRS §444-7 for the definitions of an "A" or "B" project.), respectively, and the "A" and "B" contractor obtains "C" specialty contractor's licenses either on its own, or automatically under HAR §16-77-32.). The remaining work must be performed by appropriately licensed entities. It is the sole responsibility of the contractor to review the requirements of this project and determine the appropriate licenses that are required to complete the project.

Contractor _____

OFFER

For

DEPARTMENT OF WATER, COUNTY OF KAUA'I,
LIHU'E, KAUA'I, HAWAI'I

_____ 20 _____

Chief Procurement Officer
Department of Water
County of Kaua'i
4398 Pua Loke Street
Lihu'e, Hawai'i 96766

Dear Sir:

Pursuant to and in compliance with your Invitation For Bids and other Contract Documents relating thereto, the undersigned Offeror, having familiarized itself with the terms of the contract, the local conditions affecting the performance of the contract and the cost of the work at the place where the work is done, the plans and specifications, "General Provisions for Construction Contracts of the Department of Water", "Water System Standards, 2002", Invitation For Bids, and other Contract Documents, hereby proposes and agrees to perform, within the time stipulated in the said documents, including all its component parts and everything required to be performed, and to provide and furnish any and all of the labor, materials, tools, expendable equipment, and all utility and transportation services necessary to perform the contract, in a workmanlike manner, in place complete all of the work covered by the contract in connection with these specifications and accompanying construction plans titled:

**JOB NO. 16-04, Water Plan 2020 #WKK-03,
MCC, Chlorination Facilities – Kilauea Wells No. 1 and No. 2,
KAUA'I, HAWAI'I**

on file in the office of the Department of Water for,

TOTAL SUM OFFER _____ DOLLARS
(words)

(\$ _____) said total sums being itemized on the following pages:



OFFER SCHEDULE

**JOB NO. 16-04, Water Plan 2020 #WKK-03,
MCC, Chlorination Facilities – Kilauea Wells No. 1 and No. 2,
KAUA‘I, HAWAII**

ITEM NO.	ESTIMATED QUANTITY		DESCRIPTION	UNIT PRICE	TOTAL
			SPECIAL PROVISIONS SECTION SP-5 – STRUCTURAL		
1	1	LS	Generator shelter concrete work, including but not limited to: preparation of subgrade, base course, formwork, reinforcing steel and concrete for the generator shelter foundation, generator shelter roof, and equipment pads, inclusive of all appurtenances and incidentals, in place complete.		\$
2	1	LS	Existing control building concrete work, including but not limited to: formwork, reinforcing steel, and concrete for the control building new roof, inclusive of all appurtenances and incidentals, in place complete.		\$
3	1	LS	Concrete Unit Masonry, including but not limited to: unit masonry, reinforcing steel, and grout for the generator shelter, inclusive of all appurtenances and incidentals, in place complete.		\$
4	1	LS	Concrete Unit Masonry, including but not limited to: unit masonry, reinforcing steel, and grout for the control building, inclusive of appurtenances and incidentals, in place complete.		\$
5	1	LS	Miscellaneous metalwork, to include the following items, inclusive of all appurtenances and incidentals, in place complete. <ul style="list-style-type: none"> • Anchorage requirements for the generator shelter and all equipment, including but not limited to: anchors, grout, repair, mortar, and adhesives. • Steel bollards (qty. 3) for the generator shelter, including but not limited to: concrete, reinforcement, flanges, and painting, in place complete. 		\$
			SPECIAL PROVISIONS SECTION SP-6 –ARCHITECTURAL		
6	1	LS	Control building architectural work, to include the following items, inclusive of all appurtenances and incidentals, in place complete.		\$

ITEM NO.	ESTIMATED QUANTITY		DESCRIPTION	UNIT PRICE	TOTAL
			<ul style="list-style-type: none"> • Demolition and disposal of existing wood and tile roof • Demolition of existing wooden wall panel and vent • Installation of new fluid-applied elastomeric roofing • Installation of new gutters and downspout with splashblocks • Installation of new hurricane-rated metal shutters by licensed dealer • Replacement of existing doors with hurricane-rated metal doors and hardware 		
7	1	LS	<p>Generator shelter architectural work, to include the following items, inclusive of all appurtenances and incidentals, in place complete.</p> <ul style="list-style-type: none"> • Fluid-applied elastomeric roofing • Louvers, including but not limited to: hardware and caulking. • Metal door, including but not limited to: framing and finish hardware. • Coiling doors, including but not limited to: framing, finish hardware, and operator. • Metal drip pan 		\$
8	1	LS	<p>Generator shelter and control building extension interior and exterior painting and coating, including but not limited to: surface preparation, priming, paint or coating, caulking, sealants, and all appurtenances and incidentals, in place complete.</p>		\$
			SPECIAL PROVISIONS SECTION SP-7 – MECHANICAL		
9	1	LS	<p>Generator exhaust system, including but not limited to: piping, hoses, valves, fittings, supports, wall thimbles, quick disconnect system, reinforcement, and testing, inclusive of all appurtenances and incidentals, in place complete.</p>		\$
10	1	LS	<p>Fire extinguisher, including but not limited to: mounting brackets and nameplates, inclusive of all appurtenances and incidentals, in place complete.</p>		\$
11	1	LS	<p>Pump No. 2 replacement, to include the following items, inclusive of all appurtenances and incidentals, in place complete.</p>		\$

ITEM NO.	ESTIMATED QUANTITY		DESCRIPTION	UNIT PRICE	TOTAL
			<ul style="list-style-type: none"> • Demolition and disposal of existing pump system, including but not limited to: existing pump, motor, discharge column, discharge head, flange adapter, and all associated appurtenances. • Furnishing and installation of new pump system, including but not limited to: new pump, motor, discharge head, discharge column, pump and piping adapters, hoses, sole plate, and all other appurtenances. • Reconnection and testing of existing air valve, pre-lube system, and all associated appurtenances. • Hydrotesting, cleaning, and commissioning of new pump system. 		
			<p>SPECIAL PROVISIONS SECTION SP-8 – ELECTRICAL</p>		
12	1	LS	<p>Demolition, to include the following items, inclusive of all appurtenances and incidentals, in place complete.</p> <ul style="list-style-type: none"> • Demolition and removal of existing electrical service equipment, including main service panelboard, surge arrester, CT cabinet, meter sockets, pull box, and associated conduit and wiring. Coordination with KIUC for removal of meter and CTs. • Removal of existing service conductors from the KIUC transformer abandonment of existing ductbank in place. Coordination with KIUC for determination and removal of conductors. • Demolition and removal of existing motor control center (MCC) in the well pump control building, including all associated wiring and components. Modification of existing concrete equipment pad for the MCC. • Demolition and removal of existing power factor correction capacitors and capacitor disconnects, including conduit and wiring. • Demolition and removal of existing secondary MCC lineup, including associated components and wiring. 		\$

ITEM NO.	ESTIMATED QUANTITY		DESCRIPTION	UNIT PRICE	TOTAL
			<ul style="list-style-type: none"> • Demolition and removal of existing interior and exterior light fixtures at the control building, including associated conduit and wiring. • Demolition and removal of existing door security switches and associated junction boxes, conduits, and wiring. • Demolition and removal of existing signal wiring and exposed conduits for well level and well flow signals to RTU 82. • Demolition and removal of existing pump disconnect switch, junction boxes, flexible conduit, and wiring at Well Pumps 1 and 2, exclusive of items associated with discharge pressure transmitters and discharge flow meters. Demolition and removal of existing conduit stub-ups at Well Pumps 1 and 2. Abandonment of existing Pump 1 power and control ductbank in place. 		
13	1	LS	Provision of temporary electrical system, inclusive of all appurtenances and incidentals, in place complete: <ul style="list-style-type: none"> • Temporary MCC in outdoor enclosure, including all components, wiring, and concrete equipment pad. • Modification of existing main service panelboard to feed temporary equipment. • Temporary transfer of existing building 120V loads to Panel PNL-A. • Temporary SCADA connections. • All temporary conduit and wiring to feed existing equipment. • Removal and salvage of temporary MCC to DOW's Lihue Baseyard; demolition of temporary MCC concrete pad. • Removal of all temporary conduit and wiring (where not remaining as part of the permanent system). 		\$
14	1	LS	Provision of new generator building electrical system, inclusive of all appurtenances and incidentals, in place complete: <ul style="list-style-type: none"> • Electrical service equipment, including main panelboard, CT cabinet, meter socket, and 		\$



ITEM NO.	ESTIMATED QUANTITY		DESCRIPTION	UNIT PRICE	TOTAL
			<p>pullbox. Coordination with KIUC to install meter socket, CTs, and wiring.</p> <ul style="list-style-type: none"> • Panelboard PNL-B. • Generator terminal box. • Building lighting and receptacles. • Building door security system. • Building grounding system. • All new conduit and wiring. 		
15	1	LS	<p>Provision of all new electrical ductbanks at the site, including conduit and wiring, inclusive of all appurtenances and incidentals, in place complete:</p> <ul style="list-style-type: none"> • Electrical service ductbank from the KIUC transformer to the new service equipment at the generator building. • Ductbank between generator shelter and well pump control building. • Ductbank to Well Pump 1. • Tie-in to existing Well Pump 2 ductbank. 		\$
16	1	LS	<p>Provision of new electrical equipment at the well pump control building, inclusive of all appurtenances and incidentals, in place complete:</p> <ul style="list-style-type: none"> • Well pump MCC, including all components and wiring. • Panel PNL-A. SCADA termination cabinet, including terminal blocks. • Disconnect switches for two chlorine booster pumps. • Building lighting and receptacles. • Building grounding system. • Door security switches. • All new conduit and wiring. 		\$
17	1	LS	<p>Electrical work at Pump No. 1, inclusive of all appurtenances and incidentals, in place complete:</p> <ul style="list-style-type: none"> • Fused disconnect switch. • All junction boxes, conduit, and wiring, including new conduit stub-ups at the pump area. 		\$
18	1	LS	<p>Electrical work at Pump No. 2, inclusive of all appurtenances and incidentals, in place complete:</p> <ul style="list-style-type: none"> • Fused disconnect switch. • All junction boxes, conduit, and wiring, including new conduit stub-ups at the pump area. 		\$

ITEM NO.	ESTIMATED QUANTITY		DESCRIPTION	UNIT PRICE	TOTAL
19	1	LS	Connections to existing SCADA RTU 82, including wiring from SCADA termination cabinet, inclusive of all appurtenances and incidentals, in place complete.		\$
20	1	LS	All startup and testing for electrical equipment, inclusive of all appurtenances and incidentals.		\$
21	1	LS	Performance of a short-circuit study, coordination study, and arc flash hazard analysis in accordance with the Special Provisions, inclusive of the following: <ul style="list-style-type: none"> • Preliminary report compiling and summarizing the results of the various studies for verification of equipment ratings and settings prior to ordering. • Final report compiling and summarizing the results of the various studies verifying the results of the preliminary report and incorporating any changes through completion of startup and testing. 		\$
22	1	AL	Allowances: <ul style="list-style-type: none"> • All fees from Kauai Island Utility Cooperative (KIUC) for materials and work performed by KIUC in support of the installation of the new electrical service 		\$ 25,000.00
			SPECIAL PROVISIONS SECTION SP-9 - CIVIL WORK		
23	1	LS	Site preparation to include the following items, inclusive of all appurtenances and incidentals, in place complete. <ul style="list-style-type: none"> • Erosion and sediment control, to include the furnishing, installation, and maintenance of silt fences, construction ingress and egress, and dust control. • Clearing and grubbing to include the removal, hauling, and disposal of all shrubs, bushes, and plants within limits of project area. • Excavation and earthwork for new site work and new generator building foundation to include excavation, stockpiling, and storage of earthwork • Demolition, removal, hauling, and disposal of all existing asphalt concrete pavement, 		\$

ITEM NO.	ESTIMATED QUANTITY		DESCRIPTION	UNIT PRICE	TOTAL
			including all appurtenances and incidentals in place complete		
24	1	LS	New site work, to include the following items, inclusive of all appurtenances and incidentals, in place complete. <ul style="list-style-type: none"> Asphalt concrete pavement: Furnish and install all materials needed for asphaltic concrete pavement to include preparation of subgrade, aggregate base course, asphaltic concrete, and tack coat. Concrete headers and curbs: Furnish and install all materials needed for concrete headers and curbs, included but not limited to preparation of subgrade, base course, formwork, concrete, and reinforcement. Steel bollards: Furnish and install all materials needed for preparation of subgrade, base course, concrete footings, pipe steel bollards, and painting. 		\$
25	1	LS	Grading and site restoration, including but not limited to: earthwork, hydromulching, grassing, irrigation, and maintenance until establishment is complete, and all appurtenances and incidentals, in place complete.		\$
26	1	AL	Allowances <ul style="list-style-type: none"> Relocation of unknown utilities 		\$ 10,000.00
			SPECIAL PROVISIONS SECTION SP-10 – GEOTECHNICAL WORK		
27	1	LS	Geotechnical monitoring and testing, including but not limited to: retaining of a third-party geotechnical engineer for monitoring of earthwork activities, sieve testing of aggregates and materials, compaction and fill testing and reports, and all appurtenances and incidentals, in place complete.		\$
			TOTAL SUM OFFER (Items 1 to 27 inclusive)		\$

SCHEDULE B
HAWAI'I PRODUCTS PREFERENCE

In accordance with HRS §103D-1002, the Hawai'i products preference is applicable to this solicitation. Hawai'i Products ("HP") are available for those items noted on Schedule B, below. The Hawai'i products list is available on the SPO webpage at www.spo.hawaii.gov/for-state-county-personnel/manual/procurement/solicitation/goods-services-construction/preferences/hawaii-product-preferences/ or go to the SPO Home page, click on "For Vendors" tab; click on Preferences, Hawai'i Product Preferences to view. Offeror transmitting a Hawai'i Product (HP) shall identify the HP on Schedule B-1.

Any person desiring a Hawai'i product preference shall have the product(s) certified and qualified if not currently on the Hawai'i products list, prior to the deadline for receipt of offer(s) specified in the procurement notice and solicitation. The responsibility for certification and qualification shall rest upon the person requesting the preference. Persons desiring to qualify their product(s) not currently on the Hawai'i product list shall complete form SPO-038, Certification for Hawai'i Product Preference and submit, via email to the Procurement Officer issuing the solicitation, and provide the solicitation number and title in the subject line, and include all additional information required by the Procurement Officer. For each product, one form shall be completed and transmitted (i.e. 3 products should have 3 separate forms completed). Form SPO-038 is available on the SPO webpage at <http://hawaii.gov/spo> under the 'Quicklinks' menu; click on 'Forms for Vendors, Contractors, and Service Providers'.

When a solicitation contains both HP and non-HP, then for the purpose of selecting the lowest bid or purchase price only, the price offered for a HP item shall be decreased by subtracting 10% for the class I or 15% for the class II HP items offered, respectively. The lowest total offer, taking the preference into consideration, shall be awarded the contract unless the offer provides for additional award criteria. The contract amount of any contract awarded, however, shall be the amount of the price offered, exclusive of the preferences.

Change in Availability of Hawai'i product. In the event of any change that materially alters the Offeror's ability to supply Hawai'i products, the Offeror shall notify the Procurement Officer in writing no later than five (5) working days from when the Offeror knows of the change and the parties shall enter into discussions for the purposes of revising the contract or terminating the contract for convenience.

The following is a list of products that the Department anticipates will be used in this particular project; however the list is not all inclusive and additional products may be qualified.

HAWAI'I PRODUCTS LIST

HP Description	Manufacturer/Supplier	Class
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Bidders intending to use or supply a Hawai'i Product must list the price and total cost of each item f.o.b. jobsite, unloaded, including applicable general excise tax and use tax on this form. Failure to designate a Hawai'i product will mean that the Bidder is offering a non-Hawai'i product and award, if made to the bidder, will be on the basis that the bidder will deliver or use a non-Hawai'i product.

The Bidder shall list only the Manufacturers/Suppliers certified and qualified on Schedule B.

If the Department has awarded a contract under HRS, § 103D-1002, finds that in the performance of that contract there has been a failure to comply with HRS, § 103D-1002, the contract shall be voidable and the findings shall be referred for debarment or suspension proceedings under HRS 103D-702. Any purchase made or any contract awarded or executed in violation of this section shall be void and no payment shall be made by the Department on account of the purchase or contract.

SCHEDULE B-1
SCHEDULE OF MATERIAL COST
(if Hawai'i preference requested)

HAWAII PRODUCT	MANUFACTURER	CLASS	APPROX. QUANTITY	UNIT	TOTAL COST OF MATERIAL
Aggregates and Sand – Basalt, rock, cinder, limestone and coral					
Aggregates – Recycled asphalt and concrete					
Asphalt and paving materials					
Cement and concrete products					
Pre-cast concrete products					
Signs–traffic, regulatory and construction					
Soil amendments, mulch, compost					



SCHEDULE C
MANDATORY LICENSING REQUIREMENT

“A” general engineering contractors and “B” general building contractors are reminded that due to the Hawai‘i Supreme Court’s January 28, 2002 decision in Okada Trucking Co., Ltd. V. Board of Water Supply, et al., 97 Haw. 450 (2002), they are prohibited from undertaking any work, solely or as part of a larger project, that would require the general contractor to act as a specialty contractor in any area in which the general contractor has no license. Although the “A” and “B” contractor may still submit an offer on and act as the “prime” contractor on an “A” and “B” project (*See, HRS § 444-7 for the definitions of an “A” and “B” project.*), respectively, the “A” and “B” contractor may only perform work in the areas in which they have the appropriate “C” specialty contractor’s license (*An “A” or “B” contractor obtains “C” specialty contractor’s licenses either on its own, or automatically under HAR § 16-77-32.*). The remaining work must be subcontracted out to appropriately licensed “C” specialty contractors. It is the sole responsibility of the contractor to review the requirements of this project and determine the appropriate licenses that are required to complete the project.

LISTING OF SUBCONTRACTORS

Sec. 103D-302, H.R.S., provides that each offer for Public Works Construction Contracts shall include the name of each person or firm to be engaged by the Offeror as a joint contractor or subcontractor in the performance of the Public Works Construction Contract. The Offer shall also indicate the nature and scope of the work to be performed by such joint contractors or subcontractors. All offers which do not comply with this requirement shall be rejected pursuant to Sec. 103D-302(b) H.R.S.

To comply with the above provisions, the offeror shall complete the schedule of the nature and scope of work by listing, where applicable, the names of the joint contractors and subcontractors to be used after the description of the nature and scope of the work.

ALL JOINT CONTRACTORS OR SUBCONTRACTORS TO BE ENGAGED ON THIS PROJECT

The Offeror certifies that the following is a complete listing of all joint contractors and/or subcontractors who will be engaged by the Offeror on this Project to perform the nature and scope of work indicated **regardless of the percentage of the value of the work to be performed by the joint contractor or subcontractor.** pursuant to Section 103D-302, Hawai‘i Revised Statutes, and understands that failure to comply with this requirement shall be just cause for rejection of the Offer.

The Offeror further understands that only those joint contractors or subcontractors listed shall be allowed to perform work on this Project. If no joint contractor or subcontractor for any subdivision of work is listed, it shall be construed that the work shall be performed by the Offeror with Offeror’s employees.

All Offerors must be sure that they possess, and that the joint contractors or subcontractors listed in the Offer possess, all the necessary specialty licenses needed to perform the work for this Project. The Offeror shall be solely responsible for assuring that all specialty licenses required to perform the work is covered in the Offer.

The Offeror shall include the license number of the joint contractors or subcontractors listed below. Failure to provide the correct names and license numbers as registered with the Contractors Licensing Board may cause rejection of the offer submitted.

It is the sole responsibility of the contractor to review the requirements of this Project and determine the appropriate licenses that are required to complete the Project.

LISTING OF ALL JOINT CONTRACTORS OR SUBCONTRACTORS

	Contractor Classification	Name of Joint Contractor or Subcontractor	License Number
C-1	Acoustical and Insulation Contractor		
C-2	Mechanical Insulation Contractor		
C-3	Asphalt Paving and Surfacing Contractor		
C-3a	Asphalt Concrete Patching, Sealing, and Striping Contractor		
C-3b	Play Court Surfacing Contractor		
C-4	Boiler, Hot-Water Heating and Steam Fitting Contractor		
C-5	Cabinet, Millwork, and Carpentry Remodeling and Repairs Contractor		
C-5a	Garage Door and Window Shutters Contractor		
C-5b	Siding Application Contractor		
C-6	Carpentry Framing Contractor		
C-7	Carpet Laying Contractor		
C-9	Cesspool Contractor		
C-10	Scaffolding Contractor		
C-12	Drywall Contractor		
C-13	Electrical Contractor		
C-14	Sign Contractor		
C-15	Electronic Systems Contractor		
C-15a	Fire and Burglar Alarm Contractor		
C-15b	Telecommunications Contractor		

	Contractor Classification	Name of Joint Contractor or Subcontractor	License Number
C-16	Elevator Contractor		
C-16a	Conveyor Systems Contractor		
C-17	Excavating, Grading, and Trenching Contractor		
C-19	Asbestos Contractor		
C-20	Fire Protection Contractor		
C-20a	Fire Repressant Systems Contractor		
C-21	Flooring Contractor		
C-22	Glazing and Tinting Contractor		
C-22a	Glass Tinting Contractor		
C-23	Gunite Contractor		
C-24	Building Moving and Wrecking Contractor		
C-25	Institutional and Commercial Equipment Contractor		
C-27	Landscaping Contractor		
C-27a	Hydro Mulching Contractor		
C-27b	Tree Trimming and Removal Contractor		
C-31	Masonry Contractor		
C-31a	Cement Concrete Contractor		
C-31b	Stone Masonry Contractor		
C-31c	Refractory Contractor		
C-31d	Tuckpointing and Caulking Contractor		

	Contractor Classification	Name of Joint Contractor or Subcontractor	License Number
C-31e	Concrete Cutting, Drilling, Sawing, Coring, and Pressure Grouting Contractor		
C-32	Ornamental, Guardrail, and Fencing Contractor		
C-32a	Wood and Vinyl Fencing Contractor		
C-33	Painting and Decorating Contractor		
C-33a	Wall Coverings Contractor		
C-33b	Taping Contractor		
C-33c	Surface Treatment Contractor		
C-34	Soil Stabilization Contractor		
C-35	Pile Driving, Pile and Caisson Drilling, and Foundation Contractor		
C-36	Plastering Contractor		
C-36a	Lathing Contractor		
C-37	Plumbing Contractor		
C-37a	Sewer and Drain Line Contractor		
C-37b	Irrigation and Lawn Sprinkler Systems Contractor		
C-37c	Vacuum and Air Systems Contractor		
C-37d	Water Chlorination and Sanitation Contractor		
C-37e	Treatment and Pumping Facilities Contractor		
C-37f	Fuel Dispensing Contractor		
C-38	Post Tensioning Contractor		

	Contractor Classification	Name of Joint Contractor or Subcontractor	License Number
C-40	Refrigeration Contractor		
C-40a	Prefabricated Refrigerator Panels Contractor		
C-41	Reinforcing Steel Contractor		
C-42	Roofing Contractor		
C-42a	Aluminum and Other Metal Shingles Contractor		
C-42b	Wood Shingles and Wood Shakes Contractor		
C-42c	Concrete and Clay Tile Contractor		
C-42e	Urethane Foam Contractor		
C-42g	Roof coatings Contractor		
C-43	Sewer, Sewage Disposal, Drain, and Pipe Laying Contractor		
C-43a	Reconditioning and Repairing Pipeline Contractor		
C-44	Sheet Metal Contractor		
C-44a	Gutters Contractor		
C-44b	Awnings and Patio Cover Contractor		
C-48	Structural Steel Contractor		
C-48a	Steel Door Contractor		
C-49b	Hot Tub and Pool Contractor		
C-51	Tile Contractor		
C-51a	Cultured Marble Contractor		
C-51b	Terrazzo Contractor		

	Contractor Classification	Name of Joint Contractor or Subcontractor	License Number
C-52	Ventilating and Air Conditioning Contractor		
C-55	Waterproofing Contractor		
C-56	Welding Contractor		
C-57	Well Contractor		
C-57a	Pumps Installation Contractor		
C-57b	Injection Well Contractor		
C-60	Solar Power Systems Contractor		
C-61	Solar Energy Systems Contractor		
C-61a	Solar Hot Water Systems Contractor		
C-61b	Solar Heating and Cooling Systems Contractor		
C-62	Pole and Line Contractor		
C-62a	Pole Contractor		
C-63	High Voltage Electrical Contractor		
C-68	Classified Specialist		
	Licensed Surveyor		
	Licensed Geotechnical Engineer		
	Licensed Structural Engineer		
	Archaeologist		
	Cultural Monitor		
	Licensed Civil Engineer		
	Supervising Control and Data Acquisition (SCADA) Contractor		
*			
*			

	Contractor Classification	Name of Joint Contractor or Subcontractor	License Number
*			
*			
*			
*			

* Contractor to add licenses as required to complete the scope of work. Attach additional sheet as needed. It is understood and agreed that the Department reserves the right to reject any and/or all offers and waive any defects when, in the Department's opinion, such rejection or waiver shall be for the best interest of the Department.

For purpose of evaluating the criterion described in this solicitation, it is understood and agreed that offers will be compared on the basis of the Total Sum Offer which shall be considered to be the total sum of actual or corrected amounts proposed on each item. The offerors signed Offer shall constitute the Offeror's official offer. The Department reserves the right to designate the contract amount based on selected Offeror's Total Sum Offer depending on the funds available for this Project.

It is also understood and agreed that the work called for under this Project must and shall be completed within **SIX HUNDRED THIRTY (630)** consecutive calendar days after written notice has been given to the successful Offeror to commence work. It is also understood and agreed that the quantities given herewith are approximate only and are subject to increase or decrease and that the undersigned will perform all quantities of work, as either increase or decrease, in accordance with the provisions of the specifications.

It is also understood and agreed that the estimated quantities shown for items for which a UNIT PRICE is listed in the Offer are only for the purpose of comparing on a uniform basis offers offered for the work under this contract, and the undersigned agrees that the undersigned is satisfied with and will not dispute said estimated quantities as a means of comparing the offers. It is understood and agreed that the Offeror will make no claims for anticipated profit or loss of profit because of a difference between quantities of the various classes of work done or the materials and equipment actually installed and the said estimated quantities. On UNIT PRICE offers, payment will be made only for the actual number of units incorporated into the finished project at the contract UNIT PRICE.

It is also understood and agreed that if the product of the UNIT PRICE offer and the number of units does not equal the total amount stated by the Offeror in the offer for any item, it will be assumed that the error was made in computing the total amount. For purpose of evaluating the criterion described in this solicitation, the stated UNIT PRICE alone will be considered as representing the Offeror's intention and the total amount offered on such item shall be considered to be the amount arrived at by multiplying the UNIT PRICE by the number of units.

It is also understood and agreed that the liquidated damages in the amount of **(ONE THOUSAND AND 00/100 DOLLARS (\$1,000.00))** for each and every calendar day in excess thereof prior to completion of the contract beyond the specified and approved completion date, shall be withheld from payments due to the Contractor, pursuant to the Damages for Delay provision contained in this solicitation.

It is also understood and agreed that if this offer is accepted, the successful offeror will contract with the Board and said offeror shall furnish the required bonds to the Board within ten (10) days from the date of receiving from the Board the contract prepared and ready for execution.

It is further understood and agreed that the successful offeror will provide all necessary materials, labor, tools, equipment, and other incidental necessary to do all the work and furnish all the materials specified in the contract in the manner and time herein prescribed and according to the requirements of the Department as therein set forth.

The undersigned further understands and agrees that by submitting this Offer, 1) the Offeror is declaring that the Offer is not in violation of Chapter 84, Hawai'i Revised Statutes, and 2) Offeror is certifying that the price(s) submitted was (were) independently arrived at without collusion.

It is also understood and agreed that if this Offer is accepted and the undersigned shall fail to or neglect to contract as aforesaid, the Board may determine that the offeror has abandoned the contract and thereupon forfeiture of the security accompanying the Offer shall operate and the same shall become the property of the Board.

Enclosed herewith is a Bidder's Bond (Bid Security)		for the sum
Surety Bond	()	
Legal Tender	()	
Certificate of Deposit	()	
Share Certificate	()	
Cashier's Check	()	
Treasurer's Check	()	
Teller's Check	()	
Certified Check	()	

of _____ DOLLARS
(\$ _____) payable to the Department of Water, being not less than the sum required under Sub-Section 2.9 "Bid Security" of the "General Provisions for Construction Contracts of the Department of Water", dated April 25, 2016.

Evidence of the undersigned Offeror having the authority to submit this Offer and to enter a contract is herewith furnished.

Respectfully submitted,

Name of Offeror

Authorized Signature

Print/Type Name & Title of above

Address, Zip Code

Telephone

Contractor's License No.

State of Hawai'i General Excise Tax License No.

Federal Employer Identification No.

Type of Organization: (Please designate)

- Sole Proprietorship Partnership
- Corporation Joint Venture
- Other (please specify) _____

State of Incorporation: Hawai'i

Other (please specify) _____

Name of Performance Bond Surety Co. _____

Address _____

Authorized to do Business in the State of Hawai'i? Yes or No

If corporation, state who will sign contract and signatory's title:

Name

Title

Name

Title



If the Offeror is a CORPORATION, the legal name of the corporation shall be set forth on the Offer, together with the signature(s) of the Officer(s) authorized to sign on behalf of the corporation and the corporate seal affixed thereto. Evidence of the authority of the Officer(s) to sign on behalf of the Corporation SHALL be attached to this page and included in the Offer. Acceptable evidence of authority to sign includes, but is not limited to, a copy of the articles of incorporation, corporate resolution, or corporate by-laws. (See HRS Ch. 415, Hawai'i Business Corporation Act).

If the Offeror is a LIMITED LIABILITY COMPANY, the legal name of the company shall be set forth on the Offer, together with the signature(s) of the member of the limited liability company or manager of the manager-managed limited liability company authorized to sign on behalf of the entity. Evidence of the authority of the Officer(s) authorized to sign on behalf of the company SHALL be attached to this page and included in the Offer.

If the Offeror is a PARTNERSHIP, the legal name of the firm shall be set forth on the Offer, together with the signature(s) of the General Partner(s) authorized to sign on behalf of the partnership. Evidence of the authority of the General Partner(s) authorized to sign on behalf of the partnership SHALL be attached to this page and included with the Offer. Acceptable evidence of authority to sign for the partnership includes, but is not limited to, a copy of the partnership registration statement or authorization signed by all of the partners. (See HRS Ch. 425, Partnerships).

If the Offeror is a SOLE PROPRIETORSHIP, Offeror's signature shall be placed above.

IFB Job No. 16-04

Appendix A-Sample Contract



CONTRACT NO. [Click here to enter text.](#)

CONSTRUCTION CONTRACT

THIS CONTRACT, effective as of the date below, is made and entered into by and between the BOARD OF WATER SUPPLY, County of Kaua'i, whose mailing address is 4398 Pua Loke Street, Līhu'e, Hawai'i 96766 (hereinafter the "BOARD") and [Click here to enter text.](#), a [Click here to enter text.](#), under the laws of the State of Hawaii, whose principle mailing address is [Click here to enter text.](#) (hereinafter the "CONTRACTOR").

RECITALS

THIS CONTRACT for construction services has been procured under:

- HRS §103D-302 (Competitive Sealed Bidding)
- HRS §103D-303 (Competitive Sealed Proposals)
- HRS §103D-305 (Small Purchase)
- HRS §103D-307 (Emergency Procurement No. [Click here to enter text.](#))

WHEREAS, ; and

WHEREAS, the Contractor is able and qualified to provide such construction services as required in this Contract; and

NOW THEREFORE, in consideration of the payment(s) hereinafter set forth to be made by the Board, the Contractor agrees to furnish and pay for all materials, supplies, tools, equipment, labor, utilities, transportation, services, and any and all other incidentals necessary to construct in place and complete, free of all liens, claims, and any encumbrances whatsoever: **Click here to enter text.** (hereinafter "Project").

1. **Contract Documents.** The Contractor agrees to complete the Project in accordance with this Contract and the following documents:

- Approved construction drawings;
- Specifications;
- Invitation for Bids Document No. [Click here to enter text.](#) and all Addenda thereto;
- Request for Proposals Project No. [Click here to enter text.](#) and all Addenda thereto;
- Bid/Proposal/Best and Final Offer;

- Method of Award;
- Wage Rate Schedule;
- Construction Schedules;
- Special Provisions;
- General Provisions for Construction Contracts of the Department of Water, dated April 25, 2016;

and those other documents attached or referred to therein, relating to the Project (hereinafter collectively referred to as "Contract Documents"). The Contractor understands and agrees that the Contract Documents including, but not limited to, those referenced in but not attached to this Contract and those referenced in but not attached to the Contract Documents, are hereby incorporated by reference into this Contract. The Contractor acknowledges and admits receipt of all Contract Documents, and acknowledges that it has reviewed, understands, and agrees with all terms and conditions in the Contract Documents and those other documents, terms and conditions referenced therein.

2. **Time of Performance.** The Contractor agrees to complete the Project within [Click here to enter text.](#) **CALENDAR DAYS**, from and including the date as specified in the written Notice to Proceed.

3. **Compensation.** For and in consideration of the Contractor's full and faithful performance of all services required to be performed under the Contract Documents, the Board hereby agrees to pay the Contractor the total maximum sum of [Click here to enter text.](#) **DOLLARS** (**\$[Click here to enter text.](#)**), federal, state, and local taxes included, in lawful money of the United States of America. The Contractor understands and agrees that payment shall be made in the manner and at the times specified in the Contract Documents, and shall also be subject to and conditioned upon such additions to or deductions from the preceding sum as may herein be made, according to the Contract Documents.
 - a. **Cost and/or Pricing:** If this Contract required Cost and/or Pricing data, the Contractor understands and agrees that the price to the Board, including profit or fee, shall be adjusted to exclude any significant sums by which the Board finds that the price was increased because the Contractor furnished cost or pricing data that was inaccurate, incomplete, or not current as of the date agreed upon between the parties.

4. **Liquidated Damages.** The Contractor understands and agrees that time is an essential factor of this Contract, and that the Board will suffer material loss by reason of delays that may occur in the Contractor's performance of the work or any portions of the work within the time or times fixed in the Contract or any extensions thereto. When the Contractor is given notice of delay or nonperformance, as specified in the Termination for Default clause of this Contract, and fails to cure in the time specified, the Contractor shall pay to the Board, as liquidated damages for any such delays or nonperformance, the sum of **[Click here to enter text.](#) DOLLARS** (**\$[Click here to enter text.](#)**), for each and every calendar day of delay or nonperformance from the day set for cure until either the Board reasonably obtains similar services if the Contract is terminated for default, or until

the Contractor provides the services if the Contractor is not terminated for default. The sums of each and every calendar day of delay or nonperformance shall be deducted from the Contract price. It is expressly stipulated by and between the Contractor and the Board that any such sums shall be deemed and taken to be liquidated damages for the Contractor's failure to perform within the specified time and not be in the nature of a penalty. To the extent that the Contractor's delay or nonperformance is excused under "excuse for nonperformance or delayed performance" of the Termination for Default clause of this Contract, liquidated damages shall not be due the Board. The Contractor remains liable for damages caused other than by delay.

5. **Bonds.** The Contractor is required to provide the following bonds, in an amount equal to 100% of the amount of the Contract price in the form(s) set forth in **Exhibit A**:

- Performance Bond (**Exhibit A1**)
- Labor and Material Payment Bond (**Exhibit A2**)
- Not Applicable

6. **Insurance.** Contractor shall procure and maintain, on a primary basis and at its sole expense, at all times during the life of the contract insurance coverages, limits, including endorsements as described Appendix "B" - Insurance, against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work by the Contractor or the Contractor's agents, representatives, employees, or subcontractors. The requirements contained therein, as well as the Department's review or acceptance of insurance maintained by the Contractor is not intended to and shall not in any manner limit or qualify the liabilities or obligations assumed by the Contractor. Unless otherwise approved by the Manager and Chief Engineer, the policy or policies of insurance maintained by the Contractor shall provide the minimum limit(s) and coverage(s) as specified in the attached Appendix "B" - Insurance and be placed with an insurance carrier authorized to do business in this state and rated A-VII by A.M. Best.

7. **Procurement Officer and Contract Administrator.** The Procurement Officer and Contract Administrator are:

If checked, the Procurement Officer and the Contract Administrator shall be the same individual.

Procurement Officer:

[Click here to enter text.](#)

[Click here to enter text.](#)

Department of Water, County of Kaua'i

4398 Pua Loke Street

Līhu'e, HI 96766

Phone: 808-245-[Click here to enter text.](#)

[Click here to enter text.](#)

Contract Administrator:

[Click here to enter text.](#)

[Click here to enter text.](#)

Department of Water, County of Kaua'i

4398 Pua Loke Street

Līhu'e, HI 96766

Phone: 808-245-[Click here to enter text.](#)

[Click here to enter text.](#)

8. **Severability.** In the event any term or provision of this Contract is declared to be invalid or illegal for any reason, this Contract will remain in full force and effect and will be interpreted as though such invalid or illegal provision were not a part of this Contract.
9. **Execution in Counterparts.** This Contract may be executed in counterparts, all of which shall be considered the same as if a single document shall have been executed, but shall become effective when such counterparts have been signed by each of the parties hereto and delivered to each party.
10. **Waiver.** Waiver of a breach or default under this Agreement shall not constitute a continuing waiver or a waiver of a subsequent breach of the same or any other provision of this Agreement.
11. **Board Defined.** As used in this Contract, “Board” means the Board of Water Supply of the County of Kaua‘i and the Department of Water, County of Kaua‘i, and its officers, agents, and employees.

[REMAINDER OF THIS PAGE INTENTIONALLY LEFT BLANK]

IN WITNESS WHEREOF, the parties hereto have hereunto caused this Contract to be executed as of the _____ day of _____, 20_____.

RECOMMENDED FOR APPROVAL

BOARD OF WATER SUPPLY,
COUNTY OF KAUA'I

Bryan Wienand, P.E.
Manager and Chief Engineer

Thomas Canute
Chairperson, Board of Water Supply

APPROVED AS TO FORM
AND LEGALITY

CONTRACTOR

Mahealani M. Krafft
Deputy County Attorney

By: Click here to enter text.
Its: Click here to enter text.

STATE OF HAWAI'I)
) ss.
COUNTY OF _____)

On this ____ day of _____, 20____ in the ____ Circuit, State of Hawai'i, before me personally appeared _____, who is personally known to me or whose identity I proved on the basis of satisfactory evidence, who being by me duly sworn or affirmed, did say that such person executed the _____, dated _____ and consisting of ____ pages at the time of notarization, as the free act and deed of such person, and if applicable in the capacity shown, having been duly authorized to execute such instrument in such capacity.

Notary Public, State of Hawai'i
Name of Notary: _____ (Affix Seal)
My Commission expires: _____

PLEASE INSERT YOUR APPLICABLE NOTARY SECTION

**EXHIBIT A1
PERFORMANCE BOND (SURETY)**

KNOW ALL BY THESE PRESENTS:

That Click here to enter text., a Click here to enter text. corporation, whose principal mailing address is Click here to enter text., as Principal, (hereinafter referred to as “Principal”), and Click here to enter text., as Surety, (hereinafter referred to as “Surety”), a corporation(s) authorized to transact business as a surety in the State of Hawai‘i, are held and firmly bound unto the Board of Water Supply, its successors and assigns, (hereinafter referred to as “Obligee”), in the amount of **Click here to enter text. DOLLARS (\$Click here to enter text.)** to which payment Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above-bound Principal has entered into a Contract with Obligee dated Click here to enter a date. for Click here to enter text. (hereinafter referred to as the “Contract”), which Contract is incorporated herein by reference and made a part hereof.

NOW THEREFORE, the condition of this obligation is such that:

If the Principal shall promptly and faithfully perform, and fully complete the Contract in strict accordance with the terms of the Contract as said Contract may be modified or amended from time to time; then this obligation shall be void; otherwise to remain in full force and effect. Surety to this bond hereby stipulates and agrees that no changes, extensions of time, alterations, or additions to the terms of the Contract, including the work to be performed thereunder, and the specifications or drawings accompanying same, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such changes, extensions of time, alterations, or additions, and agrees that they shall become part of the Contract.

In the event of Default by the Principal, of the obligations under the Contract, then after written Notice of Default from the Obligee to the Surety and the Principal, Surety shall either remedy the Default, or take over the work to be performed under the contract and complete such work, subject, however, to the limitation of the penal sum of this bond.

Signed and sealed this _____ day of _____.

**EXHIBIT A1
PERFORMANCE BOND**

KNOW ALL BY THESE PRESENTS:

That we, _____, whose mailing address is _____, as Contractor, (hereinafter called “Contractor”), is held and firmly bound unto the _____, its successors and assigns, as Obligee, (hereinafter called “Obligee”), in the amount of _____ **DOLLARS (\$_____)**, lawful money of the United States of America, for the payment of which to the said Obligee, well and truly to be made, Contractor binds itself, its heirs, executors, administrators, successors and assigns, firmly by these presents. Said amount is evidenced by:

- Legal tender;
- Share Certificate unconditionally assigned to or made payable at sight to _____;
- Certificate of Deposit, No. _____, dated _____, issued by _____, drawn on _____, a bank, savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;
- Cashier's Check No. _____, dated _____, issued by _____, drawn on _____, a bank, savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;
- Teller's Check No. _____, dated _____, issued by _____, drawn on _____, a bank, savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;
- Treasurer's Check No. _____, dated _____, issued by _____;

_____, drawn on _____, a bank, savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

Official Check No. _____, dated _____, issued by _____, drawn on _____, a bank, savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

Certified Check No. _____, dated _____, issued by _____, drawn on _____, a bank, savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____.

WHEREAS, the Contractor has by written agreement dated _____ entered into a contract with Obligee for the following PROJECT: [Click here to enter text.](#), (hereinafter called the “Contract”), which Contract is incorporated herein by reference and made a part hereof.

NOW, THEREFORE,

The condition of this obligation is such that, if Contractor shall promptly and faithfully perform the Contract in accordance with, in all respects, the stipulations, agreements, covenants and conditions of the Contract as it now exists or may be modified according to its terms, and shall deliver the PROJECT to the Obligee, or to its successors or assigns, fully completed as in the Contract specified and free from all liens and claims and without further cost, expense, or charge to the Obligee, its officers, agents, successors, or assigns, free and harmless from all suits or actions of every nature and kind which may be brought for or on account of any injury or damage, direct or indirect, arising or growing out of the doing of said work or the repair or maintenance thereof or the manner of doing the same or the neglect of the Contractor or its agents or servants or the improper performance of the Contract by the Contractor or its agents or servants or from any other cause, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

AND IT IS HEREBY STIPULATED AND AGREED that suit on this bond may be

brought before a court of competent jurisdiction without a jury, and that the sum or sums specified in the said Contract as liquidated damages, if any, shall be forfeited to the Oblige, its successors or assigns, in the event of a breach of any, or all, or any part of, the covenants, agreements, conditions, or stipulations contained in the Contract or in this bond in accordance with the terms thereof.

The amount of this bond may be reduced by and to the extent of any payment or payments made in good faith hereunder.

Signed this ____ day of _____, _____.

(Seal)

Name of Contractor

Signature

Title

STATE OF _____)
) ss.
COUNTY OF _____)

On this _____ day of _____, _____, before me appeared _____ to me personally known, who being by me was duly sworn, did say he/she is the _____ of _____, a _____; that the seal affixed to the foregoing instrument is the _____ seal of said _____; and said officer acknowledged said instrument to be the free act and deed of said _____.

Notary Public, State of _____

Name of Notary: _____

My commission expires: _____

ALL SIGNATURES MUST BE ACKNOWLEDGED BY A NOTARY PUBLIC

**EXHIBIT A2
LABOR AND MATERIAL PAYMENT BOND (SURETY)**

KNOW ALL BY THESE PRESENTS:

That Click here to enter text. a Click here to enter text. corporation, whose principal mailing address is Click here to enter text. , as principal (hereinafter referred to as "Principal"), and Click here to enter text. as Surety (hereinafter referred to as "Surety"), a corporation(s) authorized to transact business as a surety in the State of Hawai'i, are held and firmly bound unto the Board of Water Supply, its successors and assigns (hereinafter referred to as "Obligee"), in the amount of Click here to enter text. **DOLLARS** (\$Click here to enter text.), to which payment Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above-bound Principal has entered into a Contract with Obligee dated Click here to enter a date. for Click here to enter text. (hereinafter referred to as the "Contract"), which Contract is incorporated herein by reference and made a part hereof.

NOW, THEREFORE, the condition of this obligation is such that if the Principal shall promptly make payment to any Claimant, as hereinafter defined, for all labor and materials supplied to the Principal for use in the performance of the Contract, then this obligation shall be void; otherwise to remain in full force and effect.

1. Surety to this Bond hereby stipulates and agrees that no changes, extensions of time, alterations, or additions to the terms of the Contract, including the work to be performed thereunder, and the specifications or drawings accompanying same, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such changes, extensions of time, alterations, or additions, and agrees that they shall become part of the Contract.
2. A "Claimant" shall be defined herein as any person who has furnished labor or materials to the Principal for the work provided in the Contract.

As provided in Section 103D-324, Hawai'i Revised Statutes, every Claimant who has not been paid in full before the expiration of a period of ninety days after the day on which the last of the labor was done or performed or material was furnished or supplied, for which such a claims made, may institute an action against the Principal or the Principal and its Surety, on this bond

and have their rights and claims adjudicated in the action, and judgment rendered thereon; subject to the Obligee's priority on the bond. If the full amount of the liability of the Surety on the bond is insufficient to pay the full amount of the claims, then after paying the full amount due the Obligee, the remainder shall be distributed pro rata among the claimants.

Signed and sealed this _____ day of _____.

Principal Seal

By: _____

Its: _____

Surety Seal

By: _____

Its: _____

ALL SIGNATURES MUST BE ACKNOWLEDGED BY A NOTARY PUBLIC

SURETY LABOR AND MATERIAL PAYMENT BOND

STATE OF _____)
) ss.
COUNTY OF _____)

On this _____ day of _____, _____, before me appeared _____ to me personally known, who being by me was duly sworn, did say he/she is the _____ of _____, a _____; that the seal affixed to the foregoing instrument is the _____ seal of said _____; and said officer acknowledged said instrument to be the free act and deed of said _____.

Notary Public, State of _____

Name of Notary: _____

My commission expires: _____

SURETY PLEASE INSERT YOUR APPLICABLE NOTARY SECTION

EXHIBIT A2
LABOR AND MATERIAL PAYMENT BOND
(11/17/98)

KNOW ALL BY THESE PRESENTS:

That we, _____, whose mailing address is _____, as Contractor, (hereinafter called "Contractor"), is held and firmly bound unto the _____, its successors and assigns, as Obligee, (hereinafter called "Obligee"), in the amount of _____ **DOLLARS (\$_____)**, lawful money of the United States of America, for the payment of which to the said Obligee, well and truly to be made, Contractor binds itself, its heirs, executors, administrators, successors and assigns, firmly by these presents. Said amount is evidenced by:

- Legal tender;
- Share Certificate unconditionally assigned to or made payable at sight to _____;
- Certificate of Deposit, No. _____, dated _____, issued by _____, drawn on _____, a bank, savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;
- Cashier's Check No. _____, dated _____, issued by _____, drawn on _____, a bank, savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;
- Teller's Check No. _____, dated _____, issued by _____, drawn on _____, a bank, savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;
- Treasurer's Check No. _____, dated _____, issued by _____;

_____, drawn on _____, a bank, savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

Official Check No. _____, dated _____, issued by _____, drawn on _____, a bank, savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

Certified Check No. _____, dated _____, issued by _____, drawn on _____, a bank, savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____.

WHEREAS:

The Contractor has by written agreement dated [Click here to enter a date.](#) entered into a contract with Obligee for the following PROJECT: [Click here to enter text.](#), (hereinafter called “Contract”), which Contract is incorporated herein by reference and made a part hereof.

NOW, THEREFORE,

The condition of this obligation is such that, if Contractor shall promptly and faithfully perform the Contract in accordance with, in all respects, the stipulations, agreements, covenants and conditions of the Contract as it now exists or may be modified according to its terms, free from all liens and claims and without further cost, expense or charge to the Obligee, its officers, agents, successors or assigns, free and harmless from all suits or actions of every nature and kind which may be brought for or on account of any injury or damage, direct or indirect, arising or growing out of the doing of said work or the repair or maintenance thereof or the manner of doing the same or the neglect of the Contractor or its agents or servants or the improper performance of the Contract by the Contractor or its agents or servants or from any other cause, and shall promptly pay all persons supplying labor and materials for the performance of the Contract, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

AND IT IS HEREBY STIPULATED AND AGREED that suit on this bond may be

brought before a court of competent jurisdiction without a jury, and that the sum or sums specified in the said Contract as liquidated damages, if any, shall be forfeited to the Obligee, its successors or assigns, in the event of a breach of any, or all, or any part of, the covenants, agreements, conditions, or stipulations contained in the Contract or in this bond in accordance with the terms thereof.

AND IT IS HEREBY STIPULATED AND AGREED that this bond shall inure to the benefit of any and all persons entitled to file claims for labor performed or materials furnished in said work so as to give any and all such persons a right of action as contemplated by Sections 103D-324(d) and 103D-324(e), Hawai'i Revised Statutes.

The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment of mechanics' liens which may be filed of record against the PROJECT, whether or not claim for the amount of such lien be presented under and against this bond.

Signed this ____ day of _____, _____.

(Seal)

Name of Contractor

Signature

Title

ALL SIGNATURES MUST BE ACKNOWLEDGED BY A NOTARY PUBLIC

STATE OF _____)
) ss.
COUNTY OF _____)

On this _____ day of _____, _____, before me appeared _____ to me personally known, who being by me was duly sworn, did say he/she is the _____ of _____, a _____; that the seal affixed to the foregoing instrument is the _____ seal of said _____; and said officer acknowledged said instrument to be the free act and deed of said _____.

Notary Public, State of _____

Name of Notary: _____

My commission expires: _____

EXHIBIT B
Placeholder

IFB Job No. 16-04
Appendix B-GPCC

GENERAL PROVISIONS
FOR
CONSTRUCTION CONTRACTS
OF THE
DEPARTMENT OF WATER
COUNTY OF KAUA'I
STATE OF HAWAI'I

April 25, 2016

**GENERAL PROVISIONS
OF
CONSTRUCTION CONTRACTS
OF THE
DEPARTMENT OF WATER
COUNTY OF KAUA'I**

April 25, 2016

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**DEPARTMENT OF WATER
COUNTY OF KAUA‘I
STATE OF HAWAI‘I**

**GENERAL PROVISIONS OF CONSTRUCTION CONTRACTS
OF THE DEPARTMENT OF WATER, COUNTY OF KAUA‘I**

SECTION 1 - DEFINITIONS

When used in these provisions or elsewhere in the contract, the following terms, or pronouns used in place of them, shall have the meaning ascribed to them in this section, unless it is apparent from the context that a different meaning is intended:

- 1.1 ADDENDUM/ADDENDA** means a written document issued during the solicitation period involving changes to the solicitation documents which shall be considered and made a part of the solicitation documents and resulting contract [HAR 3-122-16.06].
- 1.2 BOARD** means the Board of Water Supply, County of Kaua‘i and the Department of Water County of Kaua‘i, its officers and employees.
- 1.3 BID** is as described in Hawai‘i Revised Statutes 103D-302.
- 1.4 BIDDER** means person or entity that has submitted a bid in response to the Department of Water, County of Kaua‘i’s Invitation for Bids.
- 1.5 BID SECURITY** means security provided at the time an offer is submitted.
- 1.6 CALENDAR DAY** means days shown on the calendar beginning at midnight and ending at midnight of the following day. If no designation of calendar or working day is made, “Day” shall mean calendar day.
- 1.7 CHANGE ORDER** means an amendment or modification of the work within the scope of the Contract, by the Contracting Officer or his/her authorized designee, directing the Contractor to make changes with or without the consent of the Contractor. [HRS 103D-104] [HAR 3-125-2][HAR 3-125-4]
- 1.8 CHIEF PROCUREMENT OFFICER** means the Manager and Chief Engineer of the Department.
- 1.9 CONTRACT** means the written agreement covering the construction of the project by the contractor, including the furnishing of labor, materials and equipment in connection therewith. It shall include these provisions, the contract and/or agreement, the notice to the bidders or proposers, the offer, the award, the special provisions, the plans, the specifications, the bond, any addendum and any written order. It shall also include all amendments to the contract by supplemental agreement thereto in writing.

1.10 CONTRACT TIME means the number of calendar days provided in the contract for completion of the contract, exclusive of authorized time extensions. The contract time will be indicated in the bid or proposal document and contract.

If the contract requires completion by a certain date, the contractor shall complete the work by that date.

1.11 CONTRACTING OFFICER means the Procurement Officer or Contract Administrator, or Construction Project Management Officer of the Department of Water, County of Kaua‘i or his or her duly authorized representative.

1.12 CONTRACTOR means the person who has entered into the contract with the Department and further defined by Section 444-1(2), HRS, as amended.

1.13 COST ANALYSIS means the evaluation of cost data for the purpose of arriving at costs actually incurred or estimates of costs to be incurred, prices to be paid, and costs to be reimbursed. [HAR 3-120-2]

1.14 COST DATA means information concerning the actual or estimated cost of labor, material, overhead, and other cost elements which have been actually incurred or which are expected to be incurred by the contractor in performing the contract. [HAR 3-120-2]

1.15 DAYS means consecutive calendar days unless otherwise specified. [HAR 3-120-2]

1.16 DEPARTMENT means the Department of Water, County of Kaua‘i, its officers and employees.

1.17 EXTENDED OVERHEAD includes project field office rental, salaries of field office and management staff, field office staff vehicles, field office utilities and telephone, and field office consumables, project fees, project bonding, project insurances and all taxes including general excise tax.

1.18 FINAL PROPOSAL means the final mutually-agreed terms of the proposal submitted by the awarded Offeror in response to the County’s RFP or the Best and Final Offer accepted by the County in accordance with HAR §3-122-53 and 3-122-54.

1.19 GUARANTEE means a formal assurance of the quality or of the length of use to be expected from a product offered or constructed.

1.20 HAR means the Hawai‘i Administrative Rules of the State of Hawai‘i, as amended.

1.21 HAZARDOUS MATERIALS mean and include any and all radioactive materials, asbestos, organic compounds known as polychlorinated biphenyls, chemicals known to cause cancer or reproductive toxicity, hazardous wastes, toxic substances, and any and all other substances or materials defined as “hazardous materials,” “extremely hazardous materials,” “hazardous wastes” or “toxic substances” under or for the purposes of hazardous materials laws.

- 1.22 HAZARDOUS MATERIALS LAWS** mean and include all federal, state or local laws, ordinances, rules, regulations or codes, now or hereafter in effect, relating to environmental conditions, human health or industrial hygiene, including but not limited to the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended, 42 U.S.C. section 9601, et seq., the Resource Conservation and Recovery Act, 42, U.S.C. section 6901, et seq., the Hazardous Materials Transportation Act, 42 U.S.C. section 1801, et seq., the Clean Water Act, 33 U.S.C. section 1251 et seq., the Clean Air Act, 42 U.S.C. 7401 et seq., the Toxic Substances Control Act, 15 U.S.C. section 2601 - 2629, the Safe Drinking Water Act, 42, U.S.C. sections 300f - 300j, HRS Chapter 128D, Environmental Response Law, HRS Chapter 342B, Air Pollution Control, HRS Chapter 342D, Water Pollution, HRS Chapter 342H, Solid Waste Pollution, HRS Chapter 342J, Hazardous Waste, HRS Chapter 342L, Underground Storage Tanks, Chapter 342P, Asbestos, and any similar state or local laws or ordinances and the regulations now in effect or hereafter adopted, published or promulgated thereto.
- 1.23 HRS** means the Hawai‘i Revised Statutes of the State of Hawai‘i, as amended.
- 1.24 INVITATION FOR BIDS or IFB** means all documents, whether attached or incorporated by reference, utilized for soliciting bids under the competitive sealed bidding source selection method. [HAR 3-120-2]
- 1.25 MANAGER** means the Manager and Chief Engineer of the Department or his or her duly authorized representative.
- 1.26 NOTICE TO PROCEED or NTP** means the document issued to the Contractor designating the official commencement date of the performance under the Contract.
- 1.27 OFFER** refers to bidders and/or proposers.
- 1.28 OFFEROR** refers to bidders and/or proposers.
- 1.29 OVERHEAD** includes office expense, staff salaries, travel expenses, legal expenses, fees, insurances, bonding and all taxes including general excise tax.
- 1.30 PERSON** means an individual, a partnership, joint venture, a corporation, whichever is applicable.
- 1.31 PRICE ANALYSIS** means the evaluation of price data, without analysis of the separate cost components and profit as in cost analysis, which may assist in arriving at prices to be paid and costs to be reimbursed. [HAR 3-120-2]
- 1.32 PRICE DATA** means factual information concerning prices, including profit, for goods, services, or construction substantially similar to those being procured. In this definition, “prices” refers to offered or proposed selling prices, historical selling prices, and current selling prices of such items. This definition refers to data relevant to both the general contractor and subcontract prices. [HAR-3-120-2]

1.33 PROPOSAL means the executed document submitted by an Offeror in response to a Request for Proposals. [HAR 3-120-2].

1.34 PROPOSER means person or entity that has submitted an offer in response to the Department of Water, County of Kaua'i's Invitation for Bids or Request for Proposal.

1.35 REFERENCE SPECIFICATIONS means the most recently adopted and published edition of such specifications referred to on the date of the notice to bidders or proposers is contemplated, unless otherwise specified.

References are on file at the Department of Water for review by prospective bidders or proposers. Upon request, copies of a section or sections of the references will be made available pursuant to the Kaua'i County Code on reproducible charges for public records.

1.36 REQUEST FOR PROPOSALS or RFP means all documents, whether attached or incorporated by reference, utilized for soliciting proposals under the competitive sealed proposal source selection method. [HAR 3-120-2]

1.37 RESPONSIBLE OFFEROR means a person who has the capability in all respects to perform fully the Contract requirements, and the integrity and reliability which will assure good faith performance. [HRS 103D-104]

1.38 RESPONSIVE BIDDER or OFFEROR means a person who has submitted an offer which conforms in all material respects to the IFB or RFP. [HAR 3-120-2]

1.39 SOLICITATION means an invitation for bids, request for proposals, or a request for quotations, or any other document issued by the County for the purpose of soliciting bids or proposals to perform a County contract. [HAR 3-120-2]

1.40 STATE means the State of Hawai'i.

1.41 WARRANTY means a written statement that promises the good condition of a product and states that the maker is responsible for repairing or replacing the product for a certain period of time after its purchase.

1.42 WORKING DAY means a calendar day, exclusive of: (1) Saturdays, Sundays and State recognized legal holidays, (2) days during which the Contractors required to suspend construction operations, and (3) days on which weather and other conditions not under the control of the contractor will not permit construction operations to proceed for at least 5 hours of the day. The contractor shall perform the controlling item or items of work.

1.43 OTHER REFERENCES

A. Abbreviations.

The following abbreviations shall refer to the technical society, organization, body, code, rules or standard, listed opposite each abbreviation:

AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
AGC	Associated General Contractors of America
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
ASCE	American Society of Civil Engineers
ASTM	American Society for Testing and Materials
AWWA	American Water Works Association
AWRA	American Water Resources Association
HRS	Hawai'i Revised Statutes
HAR	Hawai'i Administrative Rules
IANPO	International Association of Plumbing & Mechanical Officials
MUTCD	Manual on Uniform Traffic Control Devices
NEC	National Electric Code
NEMA	National Electric Manufacturers Association
NSF	National Sanitation Foundation
UL	Underwriter's Laboratory
USGS	U.S. Geological Survey

B. **Standard Detail Drawings, Water Standards, Specifications and Special Provisions.**

When reference is made to standard detail drawings, Water Standards, specifications or special provisions, such referral shall be to the standard detail drawings, Water Standards, specifications or special provisions of the Department of Water, as amended.

Water Standards shall mean the “Water System Standards, State of Hawai‘i, 2002”, as amended, as adopted by Department of Water, County of Kaua‘i; Board of Water Supply, City and County of Honolulu; Department of Water Supply, County of Maui; and Department of Water Supply, County of Hawai‘i.

SECTION 2 – BIDDING/PROPOSAL INSTRUCTIONS

2.1 DEPOSIT FOR PLANS, SPECIFICATIONS AND SPECIAL PROVISIONS

Plans, Specifications and Special Provisions of the contract may be obtained from the Department of Water, Līhu‘e, Kaua‘i, upon deposit of the amount specified in the Notice to Bidders or Notice of the Request for Proposals.

Unless otherwise stated in the Notice to Bidders or the Notice of the Request for Proposals, the deposit for the plans, specifications and special provisions will be refunded upon their return in good condition to the Department of Water within thirty (30) calendar days after the day on which bids or proposals have been opened.

Deposits shall be forfeited if the plans, specifications and special provisions are not returned within the specified time or in good condition. The plans and specifications shall not, under any circumstances be disassembled. Should the Department discover any evidence of disassembling upon the return of the plans and specifications, the deposit on said plans and specifications shall be forfeited to the Department.

The sample form of the bid or proposal shall not be detached from the Special Provisions.

2.2 QUALIFICATIONS OF OFFERORS

All offerors shall be contractors licensed in accordance with Chapter 444, Hawai‘i Revised Statutes, as amended, to perform the work under the contract.

No contract will be awarded to any person who has been suspended under and as provided in, the provisions of Chapter 104, Hawai‘i Revised Statutes, Chapter 126, Subtitle 11, Title 3, Hawai‘i Administrative Rules and HRS 103D-702, or to any firm in which such suspended person has an interest.

Qualifications of Offerors. Prospective offerors must be capable of performing the work for which solicitations are being called. Each prospective offeror must file a written notice of intention to bid or propose which shall be received not less than ten (10) calendar days prior to the day designated for opening of bids or proposals. If the tenth calendar day prior to the day designated for opening of bids or proposals is a Saturday, Sunday, or legal State holiday, the written notice must be received by the Manager no later than 4:30 p.m. on the working day immediately before said Saturday, Sunday, or legal State holiday.

Prospective offerors shall, upon request, prove to the Manager his or her responsibility by showing, among other things, his or her experience in handling the class of service, article, material or machinery to be furnished and delivered, and that he or she possesses or is in a position financially and otherwise to secure and pay for said service, article, machinery or material by submitting answers under oath to all questions contained in the “Standard Qualification Questionnaire for Prospective Offerors on Department of Water Contracts” as

required by Section 103D-310, Hawai'i Revised Statutes, as amended, to the Department not less than ten (10) calendar days prior to the day fixed for the opening of the bids or proposals.

All information contained in answers to the questionnaire shall be and remain confidential. Questionnaires so submitted shall be returned to such offerors after having served their purpose. (Auth: 3-122-108 HAR)

2.3 CERTIFICATION OF HEALTH AND SAFETY

a) The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on safety of persons or property or their protection from damage, injury or loss. The cost of Safety and Health shall not be paid for directly but shall be considered incidental and included in the prices bid for the various items of work.

b) Safety and Health Certificate of Compliance. A certificate of compliance shall be submitted with each offer certifying that, if awarded the contract, the offeror will comply with Section 396-18, HRS, relating to safety and health programs for County construction projects, where the offer amount is in excess of \$100,000. The certificate of compliance shall be submitted with the offer. Failure to submit the required certification shall be grounds for disqualification of the offer.

2.4 DETERMINATION OF RESPONSIBILITY

The Contracting Officer shall determine, on the basis of available information collected, the responsibility or nonresponsibility of a prospective offeror.

If the Contracting Officer requires additional information, the prospective offeror shall promptly supply such information within two (2) working days from the date requested. Failure to supply the requested information within the above stated time may be considered unreasonable and may be grounds for a determination of nonresponsibility.

Notwithstanding the paragraph immediately above, the Contracting Officer shall not be precluded from requesting additional information.

Upon determination that a prospective offeror is not fully qualified to perform the work, the shall afford the prospective offeror an opportunity to be heard. Upon conclusion of the hearing and if still of the opinion that the offeror is not fully qualified to perform the work, the Contracting Officer shall refuse to receive or consider any offer offered by the prospective offeror.

A written determination of nonresponsibility of an offeror shall be made by the Contracting Officer. The prospective offeror shall be immediately notified of the determination. The decision of the Contracting Officer shall be final unless the offeror applies for administrative review pursuant to Chapter 126, Subtitle 11, Title 3, HAR. (Auth: HRS: 103D-310) (Imp: HRS 103D-310) (Auth: 3-122-108, HAR)

2.5 OFFER FORM

Offers must be on an offer form provided for such purpose by the Department. Offers must be signed in ink by the person or persons duly authorized to sign offers in the space provided for signature on the offer forms. In the case of a domestic corporation, the title or titles of the person or persons signing must be stated. Where the offeror is an association or group, the title or titles of the person or persons signing must be stated and an affidavit of the association or group must be attached which acknowledges the authority of the signer or signers to sign offers and all other necessary documents in connection therewith for the association or group.

Offers shall be sealed and enclosed in envelopes showing the name of the project. Unless otherwise specified, offerors shall submit offers on all items shown on the offer form. Offers shall be typewritten or printed in ink. Errors may be erased or crossed out, and corrections typewritten or printed in ink must be initialed in ink by the persons or persons signing the bids.

The offers shall be deposited at the Department, not later than the time specified for such opening. Offers received after the specified time for opening in the notice, as evidenced by the time stamp of the Department, shall be considered late and rejected; however, a late offer shall not be considered late if received before contract award and would have been timely but for the action or inaction of personnel within the Department. A late offer that will not be considered for award shall be returned to the offeror unopened as soon as practicable and accompanied by a letter from the Contracting Officer stating the reason for its return. (Auth: 3-122-16.08(a)(b) HAR)

Offers transmitted via facsimile are unacceptable and will be rejected and returned to the offeror.

2.6 OFFER FORM, INTERPRETATION OF

The offer form does not necessarily outline all of the work involved in the performance of the contract, but is merely a list of items upon which the computation of compensation is to be based. The offer form contains all items to be used in such computation, and the compensation computed therefrom shall be full compensation for the performance of the contract.

If it should appear to a prospective offeror that the performance of the work under the contract or any of the matters relative thereto, is not sufficiently described or explained in the offer form, or that any discrepancy exists between different parts thereof, or that the full intent of the form is not clear, then the offeror shall submit a written request for clarification to the Contracting Officer no later than ten (10) calendar days before the day fixed for the opening of offers, as evidenced by the time-stamp of the Department. The offeror submitting the inquiry shall be responsible for its delivery.

If additional information is deemed necessary, such information will be issued in an

addendum by the Contracting Officer. The addendum will be mailed, facsimile, or delivered to all persons who have obtained the special provisions, plans, and specifications of the contract. All addenda issued shall be a part of the contract. (Auth: 3-122-16.06 HAR)

If during discussions during the RFP process, there is a need for any substantial clarification or change in the RFP, the RFP shall be amended by an addendum to incorporate the clarification or change. Addenda to the RFP shall be distributed only to priority-listed Offerors and shall be a part of the contract.

No oral interpretation, instruction or information concerning the contract given by any officer, employee or agent of the Department shall be binding on the Department. (HAR 3-122-16.06)

2.7 PRICES TO COVER ENTIRE CONTRACT

Offerors shall include in their offered prices the entire cost of the performance of the contract, and it is understood and agreed that there is included in each lump sum or unit price, the entire cost of all items incidental to the performance of the contract, covered by such lump sum or unit price offer. Offerors in figuring the offer price shall take into consideration the cost of all freight and delivery charges, marine insurance and taxes; and shall include the cost of furnishing and installing all equipment as called for in the specifications including warranty repairs of the complete unit. Whenever installation is specified, installation shall include all necessary labor, materials and other incidentals required to make a complete operative unit. When an offeror is in doubt as to the proper item to which the anticipated cost of any incidental item is to be allocated, he or she shall include such cost in the lump sum or unit price for the items that he or she deems most appropriate.

It is understood and agreed that whenever unit price(s) is/are called for on the provided page(s), all offerors must indicate their unit price(s) on the blank space(s) provided thereon. Failure to comply will be grounds for rejection. (Auth: 3-122-97 HAR).

Prices shall remain valid for ninety (90) calendar days after the established bid submission deadline.

2.8 COST AND PRICING DATA- PROPOSALS/Sole Source

a) A contractor, except as provided in subsection c herein, shall submit cost or pricing data and shall certify that, to the best of the contractor's knowledge and belief, the cost or pricing data submitted is accurate, complete and current as of a mutually determined specified date prior to the date of:

1) The pricing of any contract awarded by competitive sealed proposals or pursuant to the sole source procurement authority, where the total contract amount is expected to exceed an amount established in HAR; or

b) If this provision is applicable then the price to the Department, including profit or fee, shall be adjusted to exclude any significant sums by which the Department finds that the

price was increased because the contractor furnished cost or pricing data that was inaccurate, incomplete, or not current as of the date agreed upon between the parties.

c) This section shall not apply to contracts where:

- 1) The contract price is based on adequate price competition
- 2) The contract price is based on established catalog prices or market prices;
- 3) The contract prices are set by law or rule;
- 4) It is determined in writing that the requirements of this section may be waived.
(HRS 103D-312)

2.9 BID SECURITY

Bid security shall be required for construction contracts procured by way of invitation for bid or request for proposals, of \$25,000 or more or for construction contracts for less than \$25,000 when required by the Contracting Officer. Bid security shall be in an amount equal to at least five percent (5%) of the amount of the base bid and additive alternates or in an amount required by the terms of the federal funding.

Acceptable bid security, shall be limited to:

1. Surety bond underwritten by a company licensed to issue bonds in the State of Hawai‘i;
2. Legal tender of the United States of America; or
3. A certificate of deposit; share certificate; or cashier’s, treasurer’s, teller’s, or official check drawn by, or a certified check accepted by a bank, savings institution, or credit union insured by the United States Federal Deposit Insurance Corporation or the National Credit Union Administration and payable at sight or unconditionally assigned to the Department.
 - a. These instruments may be utilized only to a maximum of \$100,000.
 - b. If the required security or bond amount totals over \$100,000, more than one instrument not exceeding \$100,000 each and issued by different financial institutions which meet the requirements of this subsection shall be accepted. (HAR 3-122-222)

All documentation provided to the Department agency shall contain the original signatures signed in ink. (HAR 2-122-222, 3-122-223). Unless it is determined that a failure to provide bid security is non-substantial, all bids required to be accompanied by bid security that fail to have the appropriate bid security shall be rejected. Bid deposit form is attached hereto as Exhibit A. (Auth. 3-122-222; 3-122-223 HAR).

2.10 PUBLIC OPENING OF BIDS

Bids shall be opened and read publicly, at the time and place indicated in the Notice to Bidders. Bidders or their authorized agents may be present.

Bidders may request for nondisclosure of trade secrets and other proprietary data in writing. Confidential material shall be readily separable from the bid in order to facilitate public inspection of the nonconfidential portion of the bid: The Contracting Officer shall determine the validity of the request for nondisclosure. (Auth: 3-122-30, HAR)

2.11 RECEIPT AND REGISTRATION OF PROPOSALS

Proposals and modifications shall be time-stamped upon receipt and held in a secure place by the procurement officer until the established due date. Proposals and modifications shall not be opened publicly, but shall be opened in the presence of two (2) or more County officials. Proposals and modifications shall be shown only to members of the evaluation committee and Department personnel or their designees having legitimate interest in them. (Auth: 3-122-51, HAR).

2.12 EXAMINATION OF PLANS, SPECIFICATIONS, SPECIAL PROVISIONS AND SITE

Offerors shall examine the site of the proposed work and the provisions of the contract, including but not limited to the proposal, addenda, bond forms, bid form, special provisions, plans and specifications before submitting a bid or proposal. The submission of a bid or proposal shall be considered conclusive evidence that the offeror has made such examination; knows the surface and subsurface conditions of the site, the character, quality and quantities of labor, materials and equipment and other requirements necessary under the contract; and agrees to all and every item, covenant, condition and provision of the contract.

Where investigation of subsurface conditions has been made by the Department, in respect to foundation or other design, offerors may inspect the records of the Department as to such investigation and examine any sample that may be available.

Investigations of subsurface conditions are made for the purpose of design, and the Department assumes no responsibility whatsoever as to the sufficiency or accuracy of borings or of the log of test borings or reports or other investigations, or of the interpretation thereof, and there is no guaranty, either expressed or implied, that the conditions indicated are representative of those to be encountered during the performance of the contract, or any part thereof, or that the bidder or proposer may not encounter unforeseen subsurface conditions.

Making information concerning subsurface conditions available to bidders or proposers is not to be construed in any way as a waiver of the provisions of the first paragraph of this subsection and bidders or proposers must satisfy themselves through their own investigation as to conditions to be encountered.

Records of such investigations as may have been made by the Department may be inspected at the Department of Water.

2.13 TRADE NAMES AND ALTERNATIVES

Before Bid or Proposal Opening. When the plans or specifications specify one (1) or more manufacturers' brand names or makes of materials, devices or equipment or system indicating a quality style, appearance or performance, such specifications shall be deemed to be used for the purpose of establishing a standard of quality and to facilitate the description of the material or process desired and shall be deemed to be followed by the words "or equal". The offeror shall base his or her offer on either one of the specified brands or an alternate brand which the Contracting Officer has approved to be equal or better by way of addendum to such specification and/or plans. If an offeror intends to base his or her offer on an alternate brand, unless otherwise specified, he or she shall submit a written request to do so, to the Contracting Officer at the earliest date possible, but no later than ten (10) calendar days as evidenced by the time-stamp of the Department, before the day fixed for the opening of offers.

The burden of proof as to the comparative quality and suitability of alternative equipment, articles or materials shall be upon the offeror and he or she shall furnish, at his or her own expense, such information relating thereto as may be required by the Contracting Officer. The Offeror shall issue a statement of variances that lists all features of the proposed substitution which differ from the plans, specifications and/or product(s) specified and must certify that the substitution has no other variant features. Should an unlisted variance be discovered after installation of the product, the remedy shall be immediate replacement with a specified product at no cost to the Department. The Contracting Officer shall be the sole judge as to the comparative quality and suitability of alternative equipment; articles or materials and his or her decisions shall be final.

Any offeror, who bases his or her offer on an alternate brand which has been approved by the Contracting Officer, shall include in his or her offer the additional cost required for all modifications in the contract and the cost of all additional diagrams and drawings required to accommodate the alternate equipment. The modifications referred to include the changes in design that may be required for such work as, but not limited to, electrical, plumbing and other waterworks facilities.

2.14 PREFERENCES

- A. All offers shall comply with the preferences, as applicable, outlined in HAR 3-124, including but not limited to Hawai'i Products Preference and Recycled Products Preference, and the Apprenticeship Program Preference laid out in Section 103-55.6, Hawai'i Revised Statutes, as enacted by S.B. 19, Act 17, SLH 2009, and the State of Hawai'i Comptroller's Memorandum 2011-25 as amended, which provides for a Hawai'i Apprenticeship Preference for public works construction projects with estimated values of \$250,000 or greater.
- B. This subsection shall not apply whenever its application will disqualify the Department from receiving Federal funds or aid.

2.15 MODIFICATION OR WITHDRAWAL OF OFFERS

- A. **Pre-opening Modification or Withdrawal of Offers.**

Offers may be modified or withdrawn at any time prior to the time fixed in the notice to offerors for opening of offers, or if applicable, prior to the date at which the Best and Final Offer is due.

An offeror may withdraw his or her offer by: (1) a written notice received by the Department, or (2) a notice sent by facsimile machine to the Department.

A offeror may modify his or her offer by: (1) a written notice accompanying the actual modification received by the Department, stating that a modification to the offer is submitted, or (2) a written notice accompanying the actual modification by facsimile to the Department, provided the offeror submits the actual written notice and modification within two (2) working days of receipt of the facsimile. (Auth: 3-122-16.07, HAR)

B. Late Offers, Late Withdrawals and Late Modifications.

Any notice of withdrawal or notice of modification of any offer with the actual modification received by the Department after the time and date set for receipt and opening is late and shall not be considered for award except when received before contract award and would have been timely but for the action or inaction of personnel within the Department. (Auth: 3-122-16.08, HAR)

- C. After the established due date for offers, an offer may be withdrawn only if the Department fails to award the contract within ninety (90) calendar days after the established due date for offers.

2.16 LISTING OF JOINT CONTRACTORS AND SUBCONTRACTORS

Pursuant to Section 103D-302, HRS, as amended, all offerors shall state in their bids the name of each person or firm that will be engaged as a joint venture, partner, or subcontractor and the nature and scope of the work to be performed by each such joint venture, partner, or subcontractor. All bids which do not comply with this requirement shall be rejected pursuant to Sec. 103D-302(b), H.R.S.

MANDATORY LICENSING REQUIREMENT:

“A” general engineering contractors and “B” general building contractors are reminded that due to the Hawai‘i Supreme Court’s January 28, 2002 decision in Okada Trucking Co., Ltd. v. Board of Water Supply, et al., 97 Haw. 450 (2002), they are prohibited from undertaking any work, solely or as part of a larger project, which would require the general contractor to act as a specialty contractor in any area in which the general contractor has no license. Although the “A” and “B” contractor may still bid on and act as the “prime” contractor on an “A” or “B” project (See, HRS § 444-7 for the definitions of an “A” or “B” project.), respectively, the “A” and “B” contractor may only perform work in the areas in which they have the appropriate contractor’s license (An “A” or “B” contractor obtains “C” specialty contractor’s license either on its own, or automatically under HAR § 16-77-32.). The remaining work must be subcontracted out to appropriately licensed entities. **It is the sole responsibility of the contractor to review the requirements of this project and determine the appropriate licenses that are required to complete the project.**

Although the bid documents may provide a list of the contractor licenses that the County anticipates are required to complete this particular project, this list is not all inclusive and additional licenses may be required. If a specialty license/class is required to complete the scope of work and the contractor does not list said license(s), the contractor may have their bid rejected as non-responsive. Examples of specialty license/classes that should be listed are licensed surveyor, licensed geotechnical engineer, licensed structural engineer, licensed civil engineer, specialty inspectors, archaeologist, and cultural monitor.

The contractor shall be responsible under the contract for acts and omissions of his or her subcontractors, suppliers and persons either directly or indirectly employed by them, as fully as he or she is for acts and omissions of his or her own employees. Nothing in the contract shall create any contractual relation between any subcontractor, partner, joint venture or supplier and the Department or any obligation on the part of the Department to pay or cause to be paid any money to any subcontractor or supplier.

2.17 BIDS, DISQUALIFICATION OF

A. Bids which are conditional or not in compliance with the bidding instructions may be rejected.

Multiple or alternate offers. Unless specifically provided for in the solicitation, multiple or alternate offers shall not be accepted and all such offers shall be rejected (HAR 3-122-4)

B. Bids may be rejected for the following reasons including, but not limited to:

1. Bidder determined to be “nonresponsive,” pursuant to Subchapter 13, HAR. (Auth: 3-122-97, HAR); or
2. The bid is “not responsive”. Bid does not conform in all material respects to the invitation for bids by reason of its failure to meet the requirements of the specifications or permissible alternates or other acceptability criteria set forth in the invitation for bid pursuant to section 3-122-33 HAR. (Auth: 3-122-97, HAR); or
3. The good, service, or construction item offered in the bid is unacceptable because of its failure to meet the requirements of the specifications or permissible alternatives or other acceptability criteria set forth in the invitation for bids under the provisions of Sec. 3-122-33, HAR. (Auth: 3-122-97, HAR)
4. Bid submitted by any person submitting more than one (1) bid under the same or different names, under his or her own name, or through his or her agents, or through joint ventures, partnerships or corporations in which he has more than twenty-five percent (25%) interest in each of them, or through any contractor thereof.

If there is any evidence indicating that two (2) or more bidders are in collusion to restrict competitive bidding, the bids of all such bidders shall be

rejected and such evidence may be a cause for the disqualification of the participants in any future proposal involving any contract with the Department.

5. Any offer which is conditioned upon receiving award of both the particular contract being solicited and another Department contract. (Auth: 3-122-6, HAR)

2.18 PROPOSAL, DISQUALIFICATION OF

- A. A proposal may be accepted with modification or correction unless the solicitation states otherwise.
 1. This allowance must be considered in determining whether reasons exist for rejecting all or any part of a proposal.
 2. A proposal may be rejected for reasons including but not limited to:
 - a. The offeror is nonresponsible pursuant to Subchapter 13, HAR. (Auth.: 3-122-97)
 - b. The proposal, after any opportunity has passed for modification or clarification, fails to meet the announced requirements of the agency in some material respect; or
 - c. The proposed price is clearly unreasonable.

2.19 OFFEROR LIMITED ACCEPTANCE

- A. An offeror may not limit acceptance to the entire bid or proposal offering, unless allowed by the solicitation:
 1. If the acceptance of an offer is so limited by the offeror but not allowed, the offer will be determined to be not acceptable and rejected.
 2. If the acceptance of an offer is so limited by the offeror and allowed, the purchasing agency shall not reject part of the offer and award on the remainder. (3-122-97 HAR)

2.20 MISTAKES IN BIDS

- A. A bidder may correct, waive or withdraw an obvious mistake in his or her bid to the extent it is not contrary to the best interest of the Department or to the fair treatment of other bidders.
- B. Before Bid Opening. A bidder may remedy a mistake in a bid discovered before the time fixed in the notice to bidders for opening of bids by withdrawing or correcting the bid as provided in subsection 2.15 of these General Provisions.

C. After Bid Opening But Prior to Award.

1. A mistake in a bid discovered after bid opening but prior to award may be corrected or waived if:
 - a. The mistake is attributable to an arithmetical error, the Contracting Officer shall so correct the mistake. In case of error in extension of bid price, unit price shall govern.
 - b. The mistake is a minor informality which shall not affect price, quantity, quality, delivery, or contractual conditions, the Contracting Officer may waive such informalities or allow the bidder to request correction by submitting proof of evidentiary value which demonstrates that a mistake was made. The Contracting Officer shall prepare a written approval or denial in response to this request. Examples of such mistakes include:
 - (1) Typographical errors;
 - (2) Failure to return the number of signed bids required by the invitation for bids;
 - (3) Failure to acknowledge receipt of an amendment to the Invitation for Bids, but only if:
 - (a) It is clear from the bid that the bidder received the amendment and intended to be bound by its terms; or
 - (b) The amendment involved had a negligible effect on price, quantity, quality or delivery;
 - (4) Arithmetical errors;
 - (5) Transposition errors;
 - (6) Failure of a bidder to sign the bid, but only if the unsigned bid is accompanied by other material indicating the bidder's intent to be bound.
2. A mistake in a bid discovered after bid opening but prior to award may be withdrawn if the mistake is attributable to an obvious error which shall affect price, quantity, quality, delivery, or contractual conditions, provided:
 - a. The bidder requests withdrawal by submitting proof of evidentiary value which demonstrates that a mistake was made; and
 - b. The Contracting Officer prepares a written approval or denial in response to this request. (Auth: 3-122-31 HAR).

D. After Award.

A mistake in a bid discovered after award is not permissible except when the Manager makes a written determination that it would be unreasonable not to allow the mistake to be remedied. (Auth: 103D-302, HRS, 3-122-31, HAR)

2.21 DISCUSSIONS WITH OFFERORS-REQUEST FOR PROPOSALS

- A. The Department may hold discussions with priority listed offerors in order to promote understanding of the Department's requirements and priority-listed offeror's proposals; and
- B. To facilitate arriving at a contract that will provide the best value to the Department, taking into consideration the evaluation factors set forth in the request for proposals.
- C. Proposals may be accepted on evaluation without discussion.
- D. Any substantial oral clarification of a proposal shall be reduced to writing by the priority-listed offeror;
- E. If during discussions there is a need for any substantial clarification or change in the request for proposals, the request for proposals shall be amended by an addendum to incorporate the clarification or change
- F. Addenda to the request for proposals shall be distributed only to priority-listed offerors.
 - 1. The priority-listed offerors shall be permitted to submit new proposals or to amend those submitted;
 - 2. If in the opinion of the procurement officer or the evaluation committee, a contemplated amendment will significantly change the nature of the procurement, the request for proposals shall be canceled and a new request for proposals issued.

SECTION 3 - AWARD AND EXECUTION OF CONTRACT

3.1 AWARD OF CONTRACT

No contract shall be awarded to any person suspended under, and as provided in, the provisions of Chapters 104 and 444, HRS, as amended and any federal law if federal funds are used in the contract, or to any firm in which such suspended person as an interest.

A. Bids.

Award of contract, if made, shall be made to the lowest responsive, responsible bidder, whose bid meets the requirements and criteria set forth in the invitation for bids. (Auth: 3-122-33, HAR)

B. Proposals.

Award of contract, if made, shall be made to the responsible offeror whose proposal is determined in writing to provide the best value to the Department taking into consideration price and the evaluation criteria in the request for proposals. (Auth: 3-122-57, HAR)

3.2 CANCELLATION OF SOLICITATION OR AWARD

The Contracting Officer reserves the right to reject any and all offers and to waive any defect as, in his or her judgment may be in the best interest of the Department.

The Manager reserves the right to cancel the award of a contract at any time before a contract is executed by the Department and the contractor.

3.3 FUNDS, AVAILABILITY OF

A. Department of Water Funds.

No contract award shall be binding or of any force and effect without an endorsement by the Waterworks Controller certifying that there is an appropriation sufficient to cover the amount of the contract; provided that if the contract is a multi-term contract, the Waterworks Controller shall only be required to certify that there is an appropriation or balance of an appropriation sufficient to cover the amount required to be paid under the contract during the fiscal year or remaining portion of the fiscal year of each term of the multi-year contract.

This section shall not apply to any contract under which the total amount to be paid to the contractor cannot be accurately estimated at the time the contract is to be awarded. (Auth.: 103D-309 HRS).

B. State and/or Federal Funds.

A contract which is supplemented by state and/or federal funds, Section 3.3(A) above shall be applicable only to that portion of the contract price as is payable out of Board funds. As to the portion of the contract price as is expressed in the contract to be payable out of federal funds, the contract shall be construed to be an agreement to pay the portion to the contractor, only out of state and/or federal funds to be received from the state and/or federal government when the state and/or federal

funds are so received by the Board and shall not be construed as a general agreement by the Department to pay said portion out of any funds other than those which are received from the estate and/or federal government. This subsection shall be liberally construed so as not to hinder or impede the County in contracting for any project involving financial aid from the federal government. (3-122-109, HAR)

C. Contracts Utilizing One-Hundred Percent (100%) Federal Funds.

A contract which is funded one-hundred percent (100%) by federal funds shall be construed as an agreement to pay the contract price only out of federal funds to be received by the Department from the federal government when the federal funds are so received by the Department and shall not be construed as a general agreement to pay such amount at all events out of any funds other than those which are received from the federal government. (HRS 103D-309(b))

3.4 ENTERING INTO CONTRACT

Upon award of the contract to an offeror, such offeror shall enter into the contract by signing the contract and by furnishing bonds for faithful performance and payment as prescribed in the invitation for bid or proposal, copies of certificates of insurance and endorsements demonstrating compliance with the insurance policies required to be procured by the contractor and subcontractor and tax clearances prescribed in subsection 3.5 within fifteen (15) calendar days after the date the contract has been mailed to the contractor or within such further time as the Manager may allow after the offeror has received the contract for execution.

If the offeror to whom the contract is awarded fails or neglects to enter into the contract and furnish bonds, as prescribed in subsection 3.6, and the copies of certificates of insurance as required by contract, the bid security which accompanied the offer pursuant to subsection 2.9 shall be forfeited or in the case where such bid security was in the form of a surety bond, the proceeds representing the bid security shall be collected under the surety bond and the amount so forfeited or collected shall be paid to the Department. Upon such failure or neglect, the Contracting Officer may award the contract to the next lowest responsible bidder or the next responsible proposer whose proposal is determined to provide the best value to the Department, or publish another call for bids or proposals as, in his or her judgment, may be in the best interests of the Department.

3.5 RESPONSIBILITY OF OFFERORS AND TAX CLEARANCE

Upon award of the contract, HRS 103D-310 specifies that all Offerors shall comply with all laws governing entities doing business in the State, including, but not limited to HRS Chapters 237, 383, 386, 392, and 393.

In addition, pursuant to HRS 103D-328 and HRS 103-53, no contract shall be binding or effective until the purchasing agency confirms tax clearance from the director of taxation and the Internal Revenue Service. The Offeror shall provide updated tax clearances as required by the Director of Finance to comply with HRS Section 103-53, as amended.

The offeror, as proof of compliance with the requirements of section 103D-310(c), HRS, upon award of a contract shall submit, with the contract signed by the offeror, to the

Department verification using Hawai'i Compliance Express for the following requirements:

- A. A tax clearance from the director of taxation and the Internal Revenue Service, current within six (6) months of issuance date, to the effect that all tax returns due have been filed, and all taxes, interest, penalties levied or accrued under the provisions of Title 14 that are administered by the Department of Taxation and under the Internal Revenue Code against the contractor have been paid; and
- B. A certificate of compliance for chapters 383 (Hawai'i Employment Security Law), 386 (Worker's Compensation Law), 392 (Temporary Disability Insurance Law), and 393 (Prepaid Healthcare Act), HRS from the department of labor and industrial relations, current within six months of issuance date; and
- C. A certificate of good standing from the business registration division of the department of commerce and consumer affairs, current within six months of issuance date.

The offeror shall provide updated tax clearances as required by the Contracting Officer to comply with Section 103-53, HRS, as amended.

3.6 PERFORMANCE AND PAYMENT BONDS

- A. Performance and payment bonds shall be required for construction contracts procured through the IFB or RFP process:
 - 1. When the contract price is \$25,000 or more (Act 173, SLH 2012); and
 - 2. When the contract price is less than \$25,000 and is required by the Manager.
 - 3. Federally funded contracts wherein the conditions of the funding requires a performance or payment bond or both.
- B. Performance and payment bonds shall be required for construction contracts procured through the Small Purchase Method (HRS 103D-305):
 - 1. When the contract price is \$50,000.00 or over.
- C. The amount of the performance and payment bonds, when required, shall be in an amount equal to one-hundred percent (100%) of the contract price.
- D. Performance and payment bonds, shall be delivered by the contractor to the Department when the contract is executed. If the contractor fails to deliver the required performance and payment bonds, the contractor's award shall be canceled, the contractor shall be subject to a claim by the Board for all resulting damages its bid security enforced, and award of the contract shall be made to the next lowest offeror pursuant to Subchapter 11, HAR. (Auth: 3-122-224, HAR)

Acceptable forms of performance and payment bonds. Acceptable performance and payment bonds shall be limited to:

1. Surety bond underwritten by a company licensed to issue bonds in the State of Hawai'i;
 2. Legal tender of the United States of America; or
 3. A certificate of deposit; share certificate; or cashier's, treasurer's, teller's, or official check drawn by, or a certified check accepted by a bank, savings institution, or credit union insured by the United States Federal Deposit Insurance Corporation or the National Credit Union Administration and payable at sight or unconditionally assigned to the Department.
 - a. These instruments may be utilized only to a maximum of \$100,000.
 - b. If the required security or bond amount totals over \$100,000, more than one instrument not exceeding \$100,000 each and issued by different financial institutions which meet the requirements of this subsection shall be accepted. (Auth: 3-122-222, HAR)
- E. The Department shall not pay interest on any security provided.
- F. All alterations, extensions of time, extra and additional work and other changes authorized in the specifications or in any part of the contract may be made without securing the consent of the surety or sureties on the performance and payment bonds.
- G. Surety shall be subject to the approval of the Contracting Officer and shall be required to justify, as prescribed by law, provided that the Contracting Officer in his or her discretion may require each surety to justify in the prescribed amount at any time. If the surety is found to be insufficient, the contractor shall furnish a new bond with sufficient surety within ten (10) calendar days after the day it is notified of the insufficiency or within such further time as the Manager may allow in writing.
- H. Performance and payment bond forms are attached hereto as Exhibits.
- I. Every person who has furnished labor or material to the Contractor for the work provided in the contract for which a payment bond or a performance and payment bond is furnished under this section, and who has not been paid amounts due before the expiration of a period of ninety days after the day on which the last of the labor was performed or material was furnished or supplied, for which a claim is made, may institute an action for the amount, or balance thereof, unpaid at the time of the institution of the action against the Contractor or Contractor and its sureties, on the payment bond and have their rights and claims adjudicated in the action, and judgment rendered thereon; subject to the City's priority on the bond. As a condition precedent to any such suit, written notice shall be given by registered or certified mail to Contractor and surety, within ninety days from the date on which the person did or performed the last labor or furnished or supplied the last of the material for which claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the material was furnished or supplied or for whom the

labor was done or performed.

- J. Every suit instituted upon a payment bond shall be brought in the circuit court of the circuit in which the project is located, but no suit shall be commenced after the expiration of one year after the day on which the last of the labor was performed or material was supplied for the work provided in the contract. The obligee named in the bond need not be joined as a party in any suit.
- K. If the full amount of the liability of the Contractor or the Contractor and its sureties on the security is insufficient to pay the full amount of the claims, then, after paying the full amount due the City, the remainder shall be distributed pro rata among the claimants. [HAR 3-122-227]
- L. Certified copies of bonds may be requested and obtained by any person upon payment of the costs of reproduction and certification of the bonds, and postage. A certified copy of a bond shall be prima facie evidence of the contents, execution, and delivery of the original. [HAR 3-122-228]
- M. Contracts with Federal funds. In addition to the requirements of this section, whenever a contract is partially or fully funded with Federal funds, the surety companies shall be those listed in the latest issue of the U. S. Treasury Circular 570.

3.7 CAMPAIGN CONTRIBUTIONS BY STATE AND COUNTY CONTRACTORS

If awarded a contract in response to this solicitation, offeror agrees to comply with HRS §11-355, which states that campaign contributions are prohibited from a State and county government contractor during the term of the contract if the contractor is paid with funds appropriated by the legislative body between the execution of the contract through the completion of the contract. Questions regarding this statute should be directed to State of Hawai‘i Campaign Spending Commission.

3.8 EMPLOYMENT OF STATE RESIDENTS ON CONSTRUCTION PROCUREMENT CONTRACTS

Bidders are advised of the applicability of Act 68, SB 2840, HRS Section 103B, Employment of State Residents on Construction Procurement Contracts, (2010) (“Act 68”). Act 68 requires the awarded contractor to ensure that Hawai‘i Residents (as defined in the Act) compose not less than eighty percent of the workforce employed to perform the contract. This requirement shall also apply to subcontracts of \$50,000 or more in connection with any construction contract procured under HRS Chapter 103D, HRS § 103D-305 (small purchases), or if there is a conflict with any federal law as further detailed herein under “Conflict with Federal Law.” See Exhibit O.

3.9 HAWAII PROCUREMENT LAW

If any provision in this General Provisions is in conflict with any provision in the Hawai‘i Administrative Rules, Chapter 103D and 103, HRS, the provisions of the Hawai‘i Administrative Rules, Chapter 103D and 103, HRS shall control and supersede the provisions in this General Provisions.

SECTION 4 - LEGAL RELATIONS AND RESPONSIBILITY

4.1 AUTHORITY OF THE CONTRACTING OFFICER

The Contracting Officer shall decide all questions which may arise relating to the quality and acceptability of the materials furnished and work performed, the manner of performance and rate of progress of the work, the interpretation of the plans and specifications, the acceptable fulfillment of the contract on the part of the Contractor, the compensation under the contract and the mutual rights of the parties to the contract.

The Contracting Officer shall have the authority to enforce and make effective such decisions and orders which the Contractor fails to carry out promptly and diligently.

The Contracting Officer shall have the authority to suspend the work wholly or in part due to the failure of the Contractor to correct conditions unsafe for the workers or the general public; for failure to carry out provisions of the contract; for failure to carry out orders; for such periods as he may deem necessary due to unsuitable weather; for conditions considered unsuitable for the prosecution of the work or for any other condition or reason deemed to be in the public interest.

4.2 INDEPENDENT CONTRACTOR

- A. The contractor shall perform the contract as an independent contractor and shall defend, indemnify and hold harmless the Department, Board, its officer, agents, and employees from and against all claims, damages, losses, liability, and expenses, including but not limited to attorney's fees, court costs, or other alternative dispute resolution costs arising out of, resulting from, or otherwise but for the performance or furnishing of work or services under the contract for any injury, death or damages to persons or property arising out of the performance of the contract; but only to the extent caused in whole or in part by the actual or alleged acts, errors, or omissions of the Contractor, Contractor's subcontractor(s), or anyone directly or indirectly employed or hired by the Contractor or anyone for whose acts Contractor may be liable.
- B. The obligations of the contractor under Subparagraph A above shall not extend to the liability of the Department, Board, and its officers and employees because of negligence in (1) the preparation of maps, plans, drawings, land surveys, designs or specifications, or (2) the giving of directions or instructions with respect to the requirements of the contract by written order; provided that such giving of directions or instructions is the primary cause of the injury or damage.
- C. The contractor shall defend, indemnify and save the Department, Board, its officers, agents, and employees harmless from any and all claims for infringement by reason of the use of any patented design, device, process or material, in connection with work to be performed under the contract.

All royalties due or becoming due for the use of any patented design, devices, process or material used in connection with the work performed under the contract shall be paid by the contractor, and shall be held to be included in the contract price.

- D. The contractor shall agree to defend, indemnify and save harmless the Department against any and all deaths, injuries, losses and damages to persons or property, and any and all claims, demands, costs, liabilities, suits, judgments, actions or proceedings of every name, character and description which may be suffered or incurred by or brought against the Department to the extent arising from contractor's negligent performance of his or her duties and responsibilities pursuant to this contract except where said liability, loss or damage results solely from the negligence or misconduct of Department, Board, its employees or representatives.

4.3 LAWS, REGULATIONS

The contractor shall at all times keep himself fully informed, of all future and present Federal, State, County, and Department laws, ordinances, policies, rules and regulations which affect the contract and the performance thereof, including but not limited to:

- A. Chapter 103, HRS, relating to expenditure of Public Money and Public Contracts.
- B. Chapter 103D, HRS, relating to the Hawai'i Public Procurement Code.
- C. Chapter 104, HRS, relating to Wages and Hours of Employees on Public Works.
- D. Chapter 321, HRS, relating to Health Department.
- E. Chapter 377, HRS, relating to Hawai'i Employment Relations Act.
- F. Chapter 378, HRS, relating to Employment Practices.
- G. Chapter 383, HRS, relating to Hawai'i Employment Security Law.
- H. Chapter 386, HRS, relating to Worker's Compensation Law.
- I. Chapter 387, HRS, relating to Wage and Hour Law.
- J. Chapter 388, HRS, relating to Payment of Wages and Other Compensation.
- K. Chapter 390, HRS, relating to Child Labor Law.
- L. Chapter 396, HRS, relating to Occupational Safety and Health.
- M. Chapter 444, HRS, as amended, relating to licensing of contractors.

The contractor shall comply with all such present and future laws, regulations, and ordinances, including the giving of all notices necessary and incident to the performance of the contract. If any discrepancy or inconsistency is discovered between the contract and any such law, regulation or ordinance, the contractor shall forthwith report the same in writing to the Contracting Officer.

4.4 PERMITS, LICENSES

The contractor shall obtain all permits, licenses and approvals required by the Department, County, State, or Federal Government, for the execution of the contract, and pay all charges and fees therefore including, but not limited to overtime inspection, cost of preparation of documents, and any and all other costs associated with attaining required permit approvals.

4.5 NO PERSONAL LIABILITY

Neither the Contracting Officer nor the Board nor any other officer or employee of the Department, in the performance of their duties, shall incur personal liability to the contractor for any action taken in good faith.

4.6 COORDINATION OF SPECIAL PROVISIONS, PLANS, SPECIFICATIONS, GENERAL PROVISIONS, WATER STANDARDS, AND OTHER PARTS OF THE CONTRACT DOCUMENTS

The special provisions, plans, specifications, general provisions, Water Standards, contract documents and all supplemental documents are essential parts of the contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for the complete work. In case of conflict or discrepancy within any part of the contract, the stricter requirements, including Hawai'i State Statutory requirements, shall govern. Unless it is apparent that a different order of precedence is intended, the following is the precedence list with 1 taking precedence over two, two taking precedence over three, etc.:

1. Special Provisions
2. Plans
3. Specifications/Request for Proposals
4. Agreement Documents
5. General Provisions
6. Water Standards
7. Other Agency Standards

Instructions to offerors, addendas and the pre-bid or pre-proposal meeting minutes are hereby incorporated by reference and made a part of the Special Provisions.

Hawaii Standard Specifications for Road, Bridge and Public Works Construction, 2005.

Unless otherwise specified, the means and methods of Hawai'i Standard Specifications for Road, Bridge and Public Works Construction, 2005, as amended, shall govern the requirements for construction within all State and County roadway rights-of-way.

SECTION 5 - SCOPE OF CONTRACT

5.1 SCOPE OF CONTRACT

The scope of the contract encompasses the contractor's furnishing of, and payment for, all labor, supervision, skills, materials, tools, transportation, equipment and apparatus, and all incidentals necessary to perform all the work and do all the things necessary in accordance with the provisions of the contract documents by the contractor. See Sample Contract attached hereto as Exhibit J.

5.2 REQUESTS FOR INFORMATION

A. **Request for Information (RFI)** - An RFI is a written request, using attached Form Exhibit P from the contractor to the Contracting Officer, seeking an interpretation or a clarification of some requirement of the contract documents. The contractor shall clearly and concisely set forth the issue for which they seek clarification or interpretation and why a response is needed from the Department. The Contractor shall, in the RFI, set forth their interpretation or understanding of the requirement including reasons why they have reached such an understanding. Responses from the Department will not change any requirement of the contract documents unless so noted in the RFI Response by the Department.

1. The following is a non-exhaustive list of what shall NOT be accepted as an RFI:
 - a. Submittals for clearly identifiable items that should have been addressed pre-bid.
 - b. Numerous and excessive RFIs that are meant to overwhelm the Department.
 - c. Proposal for alternative construction methods or substitute items.
 - d. RFIs that are meant to address construction means and methods or site safety.
2. RFIs can only be submitted by the Contractor. Submittals by subcontractors shall be rejected outright.
3. Each RFI shall be limited to a single subject of inquiry.
4. All RFIs shall be accompanied by a lowest-cost suggested solution from the Contractor.
5. All RFIs shall include the necessary attachments and exact references. When applicable, references to design drawing numbers and specification sections and a graphic depiction of the resolution shall accompany the RFI.

6. RFIs that fail to conform to these requirements will be rejected at no fault to the Department.

B. **Response to RFI**

Response to an RFI shall be issued within ten (10) working days of receipt of the request from the contractor unless the Contracting Officer determines that a longer period of time is necessary to provide an adequate response. If a longer period of time is determined necessary by the Contracting Officer, the Contracting Officer will, within ten (10) working days of receipt of the RFI, notify the contractor of the anticipated response time.

1. The ten (10) working days referred to herein will start on the date stamped “Received” by the Department and ends on the date stamped “Sent” by the Department.
2. If the contractor submits a RFI on a schedule activity within ten (10) working days or less of float on a current project schedule, the contractor shall not be entitled to any time extension due to the time it takes the Department to respond to the request provided that the owner responds within ten (10) working days set forth above.
3. Responses to RFIs that require revisions to drawings and specifications should be incorporated into the design drawings concurrent with the processing of the RFI.

- C. Responses from the Department will not change any requirement of the contract documents unless so noted by the Department in the response to the RFI. In the event the Contractor believes that a response to a RFI will cause a change to the requirements of the contract document, the contractor shall provide written notice to the owner in accordance with the requirements of Section 5.3 of this Document. Failure to provide such written notice shall waive the contractor’s right to seek additional time or cost as laid out in Section 5.3 of this Document.

5.3 MODIFICATIONS TO THE WORK

A. **Oral Directive.**

Any directive, direction, instruction, interpretation or determination through oral order, or email (“oral directive”) from the Contracting Officer, which, in the opinion of the contractor, causes any change, can be considered as a change only if the contractor gives the Contracting Officer written notice of its intent to treat the oral directive as a change directive. The written notice must be delivered to the Contracting Officer before the contractor acts in conformity with the oral order, direction, instruction, interpretation or determination, but not more than five days after delivery of the oral order to the contractor. The written notice shall state the date, circumstances, whether a time extension will be requested, and source of the order that the contractor regards as a change. The written notice may not be waived and shall be a condition precedent to the filing of a claim by the contractor. Unless the contractor acts in accordance with this procedure, any oral directive shall not be treated as a change and the contractor waives any claim for an increase in the

contract time or contract price related to the work.

B. **Change Order.**

The Contracting Officer, at any time, and without notice to any surety, in a signed writing designated or indicated to be a change order, may unilaterally make changes in the work within the scope of the contract as may be found to be necessary or desirable and may unilaterally make changes in the time of performance of the contract that does not alter the scope of the contract work. Such changes shall not invalidate the contract or release the sureties, and the contractor will perform the work as changed, as though it had been part of the original contract. Minor changes in the work may be directed by the Contracting Officer at no change in contract price or time. Change Order form is attached hereto as Exhibit K.

1. Adjustment of price or time for performance. If any change order increases or decreases the contractor's cost of, or the time required for, performance of any part of the work under this contract, whether or not changed by the order, an adjustment shall be made and the contract modified in writing accordingly. Any adjustment in contract price made pursuant to this clause shall be determined in accordance with the price adjustment clause of this contract or as negotiated.
2. Failure of the parties to agree to an adjustment shall not excuse a contractor from proceeding with the contract as changed, provided that the Contracting Officer, within fourteen (14) calendar days after the changed work commences, makes such provisional adjustments in time for the direct costs of the work as the Contracting Officer deems reasonable.
3. Quotations for modification of work shall be submitted expeditiously and in any case no later than ten (10) working days after receipt of the Department of Water's request. All quotations shall be accompanied by a detailed written statement setting forth all charges the Contractor proposes for the change, properly itemized, and supported by sufficient substantiating data to permit evaluation of charges. All quotations shall be accompanied by a statement as to the proposed change's effect on the project's completion date. If no condition is stipulated, the Department of Water will assume that the acceptance of the quotation will have no adverse effect on the project's completion date.
4. The Contracting Officer has up to twenty (20) days to make a final decision as to whether to accept the entire cost proposal or any discrete cost item contained within the cost proposal or the proposed adjustment to contract time by a contract change order.
5. The right of the contractor to dispute the contract price or time or both shall not be waived by the contractor performing the work, provided however, that the contractor follows the notice requirements for disputes and claims established by the contract or these provisions. Contract Modification Form is attached hereto as Exhibit L.

6. Time period for claim. Within thirty (30) calendar days after receipt of a written change order under subsection, unless such period is extended by the Contracting Officer in writing, the contractor shall file notice of intent to assert a claim for an adjustment. The requirement for timely written notice cannot be waived and shall be a condition precedent to the assertion of a claim.
7. Claim barred after final payment. No claim by the contractor for an adjustment hereunder shall be allowed if notice is not given prior to final payment under this contract.
8. No payment shall be allowed to the Contractor for pricing or negotiating proposed or actual changes. No time extension will be granted for delay caused by late Contractor pricing of changes or proposed changes.
9. Additional performance bond or payment bond may be required by the procurement officer for a contract change order or modification where the contract amount increases. (HAR 3-122-225)
10. Other Claims Not Barred. In the absence of such a change order, nothing in this clause shall restrict the contractor's right to pursue a claim arising under the contract or for breach of contract. (HAR 3-125-4)

5.4 PRICE ADJUSTMENT

- A. Any adjustment in contract price shall be made in one or more of the following ways:
 1. By agreement on a fixed price adjustment before commencement of the pertinent performance or as soon thereafter as reasonably practicable;
 2. By unit prices specified in the contract or subsequently agreed upon;
 3. By the costs attributable to the events or situations under such clauses with adjustment of profit or fee, all as specified in the contract or subsequently agreed upon before commencement of the pertinent performance;
 4. In such other manner as the parties may mutually agree; or
 5. In the absence of agreement between the parties, the provisions of HRS 103D-501(b)(5) shall apply.
- B. Submission of cost or pricing data. The contractor shall be required to submit cost or pricing data if any adjustment in contract price is subject to the provisions of section 103D-312, HRS. The submission of any cost or pricing data shall be made subject to the provisions of subchapter 15, chapter 3-122, HAR. A fully executed change order or other document permitting billing for the adjustment in price under any method listed shall be issued within ten (10) days after agreement on the method

of adjustment.

- C. Determining Adjustments in Price. In determining the adjustment in price to the Department resulting from a change, the allowances for all overhead and extended overhead resulting from adjustments to contract and profit combined, shall not exceed the percentages set forth below per Chapter 3-125, HAR:
1. For the contractor, for any work performed by its own labor forces, twenty percent (20%) of the cost;
 2. For each subcontractor involved, for any work performed by its own forces, twenty percent (20%) of the cost;
 3. For the contractor or any subcontractor, for work performed by their subcontractors, ten percent (10%) of the amount due the performing subcontractor.

Not more than three (3) line item percentages for fee and overhead, not to exceed the maximum percentages shown above, will be allowed regardless of the number of tier subcontractors.

- D. The Department, in determining an adjustment in price using any of the methods listed in 5.4 A (1-4) above may not mandate that the contractor submit its proposal for a price adjustment at a specified percentage that it unilaterally considers to be acceptable.
- E. Paragraphs C. and D., herein, shall not be construed to impair the right of the Contractor and the Department from mutually agreeing to a price adjustment under any method listed in 5.4 A (1-4).

5.5 DIFFERING SITE CONDITIONS

Differing Site Conditions - Contractor's Responsibility. Unless otherwise noted, the contractor accepts the conditions at the construction site as they eventually may be found to exist and warrants and represents that the contract can and will be performed under such conditions, and that all materials, equipment, labor, and other facilities required because of any unforeseen conditions (physical or otherwise) shall be wholly at the contractor's own cost and expense, anything in this contract to the contrary notwithstanding. (H.A.R. 3-125-11)

5.6 ASSIGNMENT, CHANGE OF NAME, NOVATION

- A. **No Assignment.**
No Department contract is transferable, or otherwise assignable, without the written consent of the Manager; provided that a contractor may assign moneys receivable under a contract after due notice to the Department.
- B. **Recognition of a successor in interest; assignment.**
When in the best interest of the Department, a successor in interest may be recognized in an assignment agreement in which the transferor and the transferee

and the Department shall agree that:

1. The transferee assumes all of the transferor's obligations;
2. The transferor remains liable for all obligations under the contract but waives all rights under the contract as against the Department; and
3. The transferor shall continue to furnish, and the transferee, shall also furnish all required bonds.

C. **Change of Name.**

When a contractor requests to change the name in which he or she holds a contract with the Department, the Manager shall, upon receipt of a document indicating such change of name (for example, an amendment to the articles of incorporation of the corporation), enter into an agreement with the requesting contractor to effect such a change of name. The agreement changing the name shall specifically indicate that no other terms and conditions of the contract are thereby changed. (Auth: 3-125-14, HAR)

5.7 VALUE ENGINEERING INCENTIVE

A. **Definitions** as used in this section:

"Net savings" means those savings in project costs realized by the Department as the result of a value engineering change proposal after deducting the contractor's share of the cost savings.

"Single contract" means the single construction for which the cost savings is proposed.

"Value engineering" means an analysis of the requirements for the systems, equipment, and supplies of the single contract for the purpose of achieving a net savings by providing less costly items than those specified without impairing any essential functions and characteristics as service life, reliability, substitutability, economy of operations, ease of maintenance, and necessary standing functions.

"Value engineering change proposal" means a cost reduction proposal based on value engineering submitted by the contractor pursuant to this chapter and particularly identified as such. (HAR §3-132-1)

B. **Applicability.**

1. The provisions of this chapter shall apply to all construction contracts in excess of \$100,000. The application of value engineering incentives to contracts shall not be construed to have an effect on the solicitation or the selection of the contractor.
2. The contractor may develop and submit value engineering change proposals for drawings, designs, specifications, or other requirements of the contract. If any proposal is accepted and approved, in whole or in part, by the

procurement officer, the contract shall be modified and shall include an equitable adjustment of the contract price in accordance with this section.

3. This section shall not apply to any cost reduction proposal that is not identified as a value engineering change proposal by the contractor at the time of its submission to the procurement officer. (HAR §3-132-2)

C. **Section provisions.**

1. The processing of a value engineering change proposal shall be similar to that for any proposed contract change order and shall be considered only after the construction contract is awarded.
2. Nothing herein shall be construed to mean that the Department must accept or approve any or all value engineering change proposals submitted in accordance with this section. The OIC's interpretation and findings relative to the impairment of the functions or characteristics of the item or items covered by the value engineering change proposal shall be final.
3. Adjustment in contract prices and allowances for implementation costs shall be in accordance with this section and shall only be considered if and when the value engineering change proposal is approved by the contract officer. The receipt of the value engineering change proposal by the Department or a verbal acceptance of a value engineering change proposal by any employee of the Department shall not obligate the Department to accept the value engineering change proposal.
4. The contract officer may impose, as a condition of acceptance of any value engineering change proposal, a requirement that the contractor warrant the statements, claims, and other information contained in the value engineering change proposal. In addition, the contractor's responsibility under any such warranty shall be in addition to the liability imposed by the "guarantee of work" requirement as included in the contract.
5. The contractor shall be responsible for the new design of the facility or a portion of the facility submitted as a value engineering change proposal, including errors and omissions and, if the value engineering change proposal is for a portion of the facility, for any adverse impacts the new design may have on the unchanged portions of the facility.

D. **Conditions for a value engineering change proposal.**

1. A value engineering change proposal to a contract shall:
 - a. Result in an estimated net savings to the Department in the project cost of at least four thousand dollars (\$4,000.00) by providing less costly items than or using different construction methods from those specified in the contract without impairing any essential functions and characteristics as service life, reliability, substitutability, economy of operation, ease of maintenance, and necessary standardized features of the completed work;

- b. Require, in order to be applied to the contract, a change order to the contract; and
 - c. Not adversely impact on the performance schedule or the contract completion date.
2. As a minimum, the following information shall be submitted by the contractor with each value engineering change proposal:
- a. A description of the difference between the existing contract requirements and the value engineering change proposal and the comparative advantages and disadvantages of each including durability, service life, reliability, substitutability, economy of operation, ease of maintenance, desired appearance, design, safety standards, impacts due to construction, and other essential or desirable functions and characteristics as appropriate;
 - b. An itemization of the requirements of the contract which must be changed if the value engineering change proposal is adopted and are commendation as to how to make each change;
 - c. An itemized estimate of the reduction in performance costs that will result from adoption of the value engineering change proposal or parts thereof taking into account the costs of implementation by the contractor, including any amounts attributable to subcontractors, and the basis for the estimate;
 - d. A prediction of any effects and impacts the value engineering change proposal would have on: other costs to the Department as the costs of Department-furnished property, related items, and maintenance and operation over the anticipated life of the material, equipment, or facilities as appropriate; the construction schedule, sequence and time; and bid item totals used for evaluation and payment purposes;
 - e. A statement of the time by which a change order adopting the value engineering change proposal must be issued so as to obtain the maximum cost reduction during the remainder of the contract, noting any effect on the contract time; and
 - f. If previously submitted, the date(s) of any previous submission(s), the contract number(s) of those contract(s) for which it was submitted and the previous action(s) by the Department, if known;
3. When, in the judgment of the Contracting Officer, a value engineering change proposal alters the design prepared by a registered professional architect or engineer, the contractor shall ensure the changes to be prepared are by or under the supervision of a registered professional architect or engineer, and stamped and so certified.

4. A value engineering change proposal will be processed expeditiously and in the same manner as prescribed for any other proposal which would likewise necessitate issuance of a contract change order. Unless and until a change order applies a value engineering proposal to a contract, the contractor shall remain obligated to perform in accordance with the terms of the contract and the Department shall not be liable for delays incurred by the contractor resulting from the time required for the Department's determination of the acceptability of the value engineering change proposal. The determination of the procurement officer as to the acceptance of any value engineering change proposal under a contract shall be final.
5. The Contracting Officer may accept in whole or in part any value engineering change proposal submitted pursuant to this section by issuing a change order to the contract. Prior to issuance of the change order, the contractor shall submit complete final contract documents similar to those of the original contract showing the accepted changes and the new design and features as well as the following:
 - a. Design calculations;
 - b. The design criteria used; and
 - c. A detailed breakdown of costs and expenses to construct or implement such revisions. The change order will identify the final value engineering change proposal on which it is based.
6. When a value engineering change proposal submitted pursuant to this section is accepted under a contract, an equitable adjustment in the contract price and in any other affected provisions of the contract shall be made in accordance with this section and the "change order" clause of the contract. The equitable adjustment shall first be established by determining the effect on the contractor's cost of implementing the change, including any amount attributable to subcontractors and to the Department's charges to the contractor for architectural, engineering, or other consultant services and the staff time required to examine and review the proposal. The contract price shall then be reduced by fifty per cent (50%) of the net estimated decrease in the cost of performance.
7. The contractor may restrict the Department's right to use the data or information or both on any sheet of a value engineering change proposal or of the supporting data, submitted pursuant to this section, if it is stated on that sheet as follows:

"This data or information or both shall not be disclosed outside the Department, or be duplicated, used, or disclosed, in whole or in part, for any purpose other than to evaluate this value engineering change proposal. This restriction does not limit the Department's right to use this data or information or both if obtained from another source, or is otherwise

available, without limitations. If this proposal is accepted by the Department by issuance of a change order to the contract after the use of this data or information or both in such an evaluation, the Department shall have the right to duplicate, use and disclose any data or information or both pertinent to the proposal as accepted, in any manner and for any purpose whatsoever, and have others so do”.

8. In the event of acceptance of a value engineering proposal, the Department shall have all rights to use, duplicate, or disclose in whole or in part, in any manner and for any purpose whatsoever, and to have or permit others to do so, any data or information or both reasonably necessary to fully utilize such proposal.
9. Notwithstanding the provisions of this section, for any construction contract, the contractor shall not be precluded from making substitution requests in accordance with applicable rules and policies of the Department. The OIC shall be the sole judge of whether a proposal is a value engineering change proposal or a substitution request. (HAR §3-132-4)

E. **Value engineering sharing method.** The method by which the contractor will share a portion of the cost savings from an accepted value engineering change proposal shall be in accordance with section 3-132-4 and the following:

1. The contractor’s share in cost savings shall be for the single contract only, and no consideration shall be made for future acquisition, royalty type payment, or collateral savings.
2. The Department may accept the proposed value engineering change proposal, in whole or in part. The engineer shall issue a contract change order or modify the contract to identify and describe the accepted value engineering change proposal. (HAR §3-132-6)

5.8 SUBSTITUTIONS

A. **After Bid Opening.** Substitution of material or equipment may be allowed after the bid opening date only if:

1. The specified or prequalified item is delayed by a lengthy strike in the factory or other unforeseeable contingency beyond the control of the Contractor which would cause an abnormal delay in the project completion; or
2. All specified or prequalified items are found to be unusable or unavailable due to change or other circumstances; or
3. The Contractor is willing to provide a more recently developed or manufactured model of material or equipment of the same name manufacturer which the Contracting Officer determines to be equal or better than the one specified or prequalified.

A substitution request, regardless of reason, shall be fully explained in writing, by the Contractor including his justification for said request, quantities and unit prices involved, quotations and such other documents as are deemed necessary to support the request.

Any savings in cost will be rebated to the Department and any additional cost for the substituted items will be paid for by the Contractor.

The above shall not be construed to mean that substitutions for brand name specified materials and equipment will be allowed; the Contracting Officer reserves the right to reject and deny any request deemed irregular or not in the best interest of the Department and a request for substitution shall not in any way constitute a justification for an extension of contract time.

5.9 EXTRA WORK

No work of any kind in connection with the work covered by the specifications and plans shall be considered as entitling the Contractor to extra compensation except when the work is ordered in writing, as a change order, by the Contracting Officer.

5.10 PAYMENT FOR DELETED MATERIALS

- A. Canceled Orders – If acceptable material was ordered by the Contractor for any item deleted by an ordered change in the work prior to the date of notification of such deletion by the Contracting Officer, the Contractor shall use every reasonable effort to cancel the order. The Department shall pay reasonable cancellation charges required by the supplier excluding any markup for overhead and profit to the Contractor.
- B. Returned Materials – If acceptable deleted material is in the possession of the Contractor or is ultimately received by the Contractor, if such material is returnable to the supplier and the Contracting Officer so directs, the material shall be returned and the Contractor will be paid for the reasonable charges made by the supplier for the return of the material, excluded any markup for overhead and profit to the Contractor. The cost to the Contractor for handling the returned material will be paid for as provided in Subsection 5.4 “Price Adjustment.”
- C. Uncanceled Materials – If orders for acceptable deleted material cannot be canceled at a reasonable cost, it will be paid for at the actual cost to the Contractor including an appropriate markup for overhead and profit as set forth in Subsection 5.4 “Price Adjustment” In such case, the material paid for shall become the property of the Department of Water and the contractor shall deliver to the Department of Water Baseyard.

SECTION 6 - PERFORMANCE OF CONTRACT

6.1 TIME

Time is of the essence of the contract. Performance of the contract shall be commenced on the commencement date designated in the notice to proceed and shall be completed within the contract time specified in the contract or as computed or extended in accordance with the provisions of subsection 8.3.

- A. After the contract is completely executed, the Contracting Officer will issue the contractor a written "Notice to Proceed" designating the official date for the commencement of the work. The contractor shall submit all materials for approval. Once all materials for use on the project have been approved, the contractor shall arrange a preconstruction conference with the Contracting Officer, along with other affected agencies, firms and individuals at least ten (10) calendar days prior to the starting date for construction.

At the preconstruction conference, the contractor shall submit to the Department, the name, local address and telephone number(s) of his or her authorized superintendent of the job.

No construction work shall commence until the contractor has notified the Contracting Officer, in writing, at least one (1) week in advance of the actual date he or she will start the work to be done under the contract after the notice to proceed, and shall diligently prosecute the same to completion within the time limit provided in the contract. The contractor shall be entirely responsible for any delay in the work caused by his or her failure to give such notice to the Contracting Officer.

- B. When the contract time is on a working day basis, the Contracting Officer will furnish the contractor a weekly statement showing the number of days charged to the contract for the preceding week and the number of days specified for completion of the contract. The contractor will be allowed seven (7) days in which to file a written protest setting forth in what respect said weekly statement is incorrect; otherwise the statement shall be deemed to have been accepted by the contractor as correct.
- C. When the contract time is on a calendar-day basis, it shall consist of the number of calendar days stated in the contract beginning with the effective date of the NOTICE TO PROCEED, including all Sundays, holidays and non-working days. All calendar days elapsing between the effective dates of any orders of the Contracting Officer to suspend work and to resume work for suspensions not the fault of the contractor shall be excluded.

6.2 PERFORMANCE SCHEDULE

Within seven (7) calendar days after the commencement of the contract, or such further time as may be allowed by the Contracting Officer, the contractor shall submit for the approval of

the Contracting Officer, a practicable schedule utilizing the critical path method (CPM) for the performance of the contract. The date on which parts of the project, including the procurement of materials, plant and equipment, have been or will be started, and the contemplated dates for completion of parts of the project. If the schedule is not approved, it shall be revised as directed by the Contracting Officer. After approval, no changes in the schedule shall be made without the approval of the Contracting Officer. The approved schedule shall be updated with a three-week (3-week) schedule breakdown and two (2) copies submitted to the Department weekly, and a full schedule breakdown submitted to the Department monthly with payment request for approval. The updated schedule shall show the actual progress of work compared to the approved schedule or the latest amended schedule. The updated schedule shall be used as a basis for establishing major construction and as a check on the progress of the work performed under the contract. All schedules shall be provided via hard copy and as a Microsoft Project file/PDF file.

- * The full schedule shall include a written narrative explaining CPM network.
- * The full schedule shall account for dealing with predictable “planned (normal) adverse weather based on historical averages and be reflected appropriately.
- * The Contracting Officer does not dictate means, methods, or schedule as that is the contractors responsibility and discretion.
- * The Contracting Officer will review the CPM network for reasonableness and conformance with the plans, specifications and contract time at the baseline review and with each update.
- * Any acceleration to schedule pursuant to a directive by the owner shall be in writing.
- * Project float is a shared resource for use by contractor and owner in good faith.

6.3 OWNER-CONTRACTOR MEETING, FIELD OFFICE AND FIELD TELEPHONE

A. Owner-Contractor Meeting.

A weekly meeting is required at the jobsite field office. The meeting attendees at minimum shall be the contractor project manager and foreman, DOW project manager and inspector, and other construction related staff. The contractor shall prepare the meeting minutes and provide to the DOW construction team one day prior to next weekly meeting.

B. Field Office.

The contractor shall provide a field office for the Manager at a location designated by the Manager within the project site. It shall be available within seven (7) calendar days after issuance of Notice to Proceed for the work under the contract. The field office shall be weather-proof and not less than 120 square feet in gross floor area. The aggregate window areas of the office shall not be less than 10 percent (10%) of the floor area, and one (1) exterior door shall be provided with a keyed cylinder-type lock. The office shall be furnished with one (1) drafting-type table having a dimension of not less than 3' x 6' and a stool, adequate plan racks and hangers, one (1) desk, two (2) chairs, shelves, a broom, telephone service, air conditioning, electric lighting, paper towels, paper cups, soap, toilet paper and potable water, and shall be maintained in good repair and in a clean and sanitary condition by the contractor. If the office is not equipped with a water closet and lavatory, the contractor shall make other arrangements to provide such facilities for the Manager.

C. **Field Telephone.**

If required in the special provisions, the contractor shall provide a field telephone for the Manager. Such field telephone shall be placed at a convenient and accessible location.

6.4 DOCUMENTS TO BE KEPT ON SITE

The contractor shall keep a copy of the request for proposals, special provisions, current water system standards current standard specifications for Road and Bridge construction, approved construction drawings, approved submittals, RFI responses, approved permits, and specifications of the contract on the site of the project readily accessible for reference.

6.5 ADDITIONAL PLANS AND SPECIFICATIONS TO BE FURNISHED BY THE CONTRACTING OFFICER

If deemed necessary by the Contracting Officer, the Contracting Officer may furnish, by written order, such additional plans and specifications, during the performance of the contract as may be necessary to clarify the contract or define it in greater detail, and the contractor shall comply with such additional plans and specifications. Such additional plans and specifications shall become a part of the contract.

6.6 DRAWINGS TO BE FURNISHED BY CONTRACTOR

Shop drawings means drawings, submitted to the Department by the Contractor which shows in detail 1) the proposed fabrication and assembly of structural elements, and 2) the installation (i.e., form, fit, and attachment details) of materials or equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data and similar materials furnished by the Contractor to explain in detail specific portions of the work required by the contract.

The Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with approved construction drawings, specifications and other applicable contract requirements and shall indicate its approval thereon as evidence of such coordination and review. The Contractor shall make and supply such working or shop drawings as may be required by the Contracting Officer during the performance of the contract. The drawings shall be finished plans, and shall be neat, legible and drawn to scale. Drawings submitted without evidence of the Contractor's approval may be returned for resubmission.

The contractor shall submit three (3) prints of working or shop drawings to the Contracting Officer for approval prior to the commencement of the work under the contract or the delivery to the project site of any equipment or material covered by the drawings, whichever is later. The Contracting Officer, has twenty (20) days to approve or disapprove and will indicate such approval or disapproval of the shop drawings. If not approved as submitted the Contracting Officer shall indicate the reasons therefor. The Contracting Officer may require the drawings to be resubmitted as often as necessary to render them complete, legible and free of extensive corrections. If a resubmittal is required, the Contracting Officer shall return one (1) print to the contractor who shall make all the corrections or drawings for

approval. Any work done before such approval shall be at the Contractor's risk.

After approval, no working or shop drawings shall be changed without the written approval of the Contracting Officer; and the contractor may proceed with the parts of the project called for in such drawings.

It shall be expressly understood that review and approval of working or shop drawings and other submittals by the Contracting Officer shall not be construed to relieve the contractor of responsibility for any errors and omissions in such drawings, or the accuracy of dimensions and details and duty to perform the contract in accordance with the approved construction drawings, specifications, terms, covenants, conditions, provisions and intent thereof. It is further understood that the review and approval by the Contracting Officer of the Contractor's shop drawings, whether general or detailed, is a general review relating only to their sufficiency and compliance with the intention of the contract. The Contractor shall clearly identify and inform the Contracting Officer in writing on the shop drawing transmittal cover sheet of any deviations from the contract documents at the time of submission and shall obtain the Contracting Officer's written approval to the specified deviation prior to proceeding with any work. The contractor, at his own risk and expense, may elect to proceed with the work affected by the drawings prior to final review.

Catalog cuts or similar reproductions may be substituted for working or shop drawings in the case of assembled electrical, mechanical units and other waterworks materials to be installed, when they show information which the Contracting Officer determines to be sufficient for review and approval. The contractor shall provide all additional information that is requested by the Contracting Officer during the review and approval process.

6.7 OMISSION IN CONTRACT

Unless specified, work which is otherwise incidental to the contract although not specifically referred to in the contract shall be furnished and performed by the contractor. Labor, materials, equipment, overhead, and extended overhead directly or indirectly necessary to complete the construction of the project, whether or not the same may have been expressly provided for in the contract, shall be furnished and performed by the contractor.

6.8 CONTRACTOR TO REPORT ERRORS OR DISCREPANCIES

The contractor shall notify the Contracting Officer in writing immediately upon discovery of any error or omission in the layout given by stakes, points or instructions furnished by the Manager, or any discrepancy within the contract, or any part thereof or between the plans and the conditions of the site.

After such discovery, the contractor shall proceed with the performance of the contract only after receiving written approval from the Contracting Officer.

6.9 CONTROL OF THE CONTRACT

A. Workmanship.

The contract shall be performed in an orderly and workmanlike manner in

accordance with the latest acceptable practice and shall be of the best quality, except as clearly specified otherwise. Whenever there is a doubt as to what is permissible or the contract fails to note the quality of any work, the interpretation which calls for the best quality of work is to be followed.

B. Access to the Project.

During the performance of the contract, the contractor shall provide the Department with proper and safe facilities for access to the site of the project and the shops of the contractor and the subcontractor.

Other contractors of the Department shall be permitted access to the site of the project when it is required for performance of their respective contractors.

C. Inspection.

The performance of the contract shall be subject to the inspection of the Department, and the contractor shall supply such information and assistance as may be required to make a complete and detailed inspection. The Department may inspect each and every subdivision of the work or any part or parts or process thereof. The Department's staff shall have free access to all parts of the work at all times and shall be given every facility, information, and means of thoroughly inspecting the work done and the materials used or to be used. No work or material which may be defective in construction or quality or deficient in any of the requirements of the plans, specifications, special provisions or other contract documents will be accepted. The Department's presence or inspection on the site will not relieve the contractor of his or her deficiencies.

If the contractor wishes to work at such time of the day which is during the period other than the regular business hours of the Department of Water, County of Kaua'i or on a Saturday, Sunday or legal State holiday, he or she shall make a written request for inspectional services during such period. If such a request is made and granted, the contractor shall notify the Contracting Officer not less than twenty-four (24) hours in advance of the time when the inspectional services are required. The contractor shall pay the Department at the rate per hour designated by the Department for each employee provided pursuant to this paragraph.

D. Inspection of Plant or Site, Access to Plant or Place of Business.

1. Inspection of plant or site. Circumstances under which the Department may perform inspections include, but are not limited to, inspections of the Contractor's plant or site in order to determine: Whether the standards set forth in section 3-122-108, Hawai'i Administrative Rules, have been met or are capable of being met; and if the contract is being performed in accordance with its terms. (HAR 3-122-166)
2. Access to plant or place of business. The Department may enter a Contractor's or subcontractor's plant or place of business to:
 - a. Inspect goods or services for acceptance by the Department pursuant to the terms of a contract;

- b. Audit cost or pricing data or audit the books and records of any Contractor or subcontractor pursuant to section 3-122-175, Hawai'i Administrative Rules; and
- c. Investigate in connection with an action to debar or suspend a person from consideration for award of contracts pursuant to sections 3.126-11 through 3-126-18, Hawai'i Administrative Rules. (3-122-167,8)

E. **Samples and Test Specimens.**

When required by the Contracting Officer, test specimens or samples of materials, equipment, instruments, pipes and fittings and other Waterworks appurtenances to be used or offered for use in the performance of the contract shall be prepared and furnished by the contractor in such quantities and sizes as may be required for proper examination and tests, with information as to their sources.

The contractor shall furnish additional test specimens and samples as directed.

Test specimens and samples shall be submitted in ample time to enable the Department to make such tests or examinations as may be necessary. Laboratory tests and examinations made in a laboratory other than that of the Department shall be at the expense of the contractor.

F. **Tests.**

Tests specified by the contract, statute, regulation, Water Standards, or ordinance shall be made; and the cost thereof shall be borne by the contractor unless otherwise provided for in such contract, statute, regulation or ordinance. Such tests shall be conducted under the direction of the Contracting Officer, and the contractor shall repair any damage resulting there from.

In addition, the Contracting Officer may require such tests as he or she deems necessary to carry out his or her duties during the performance of the work under the contract. When a test is required by the Contracting Officer, the contractor under the direction of the Contracting Officer shall conduct such test and shall bear all of the costs, including the cost of tools, labor and materials necessary therefor.

G. **Site Access.**

The contractor shall provide access to the work at all times to representatives of the Department of Federal Environmental Protection agency, the State of Hawai'i Water Pollution Control, State Department of Health, and any other authorized Federal, State or County Agencies whenever the work is in preparation or in the process, and shall provide proper facilities for such access and inspection. In addition, authorized representatives of the Department and the County shall have access to any books, documents, papers and records of the contractor which are pertinent to the project for the purpose of making audit, examinations, excerpts, and transactions thereof.

H. **Removal of Defective and Unauthorized Work.**

All work which has been rejected as not conforming to the requirements of the contract shall be remedied or removed and replaced by the Contractor in an

acceptable manner at no cost to the Board. Any work done beyond the work limits shown on the plans and specifications or established by the Contracting Officer, as authorized under the terms of the Contract, or any additional work done without written authority will be considered as unauthorized and will not be paid for. Work so done may be ordered removed at the Contractor's expense. Upon failure on the part of the Contractor to comply promptly with any order of the Contracting Officer made under the provisions of this subsection, the Contracting Officer shall have authority to cause defective work to be remedied or removed and replaced and unauthorized work to be removed and to deduct the costs from any monies due or to become due the Contractor.

6.10 PERSONAL SUPERVISION

The contractor shall be present on site in person, or by a responsible agent with authority to act for the contractor in connection with the contract during the performance of the contract.

The contractor shall file with the Contracting Officer a written statement signed by the contractor giving the names of the designated competent person(s) for trench excavation and confined space entry, any and all supervisors, foreman and employees who are authorized to act in place of the contractor, and any communication signed in behalf of the contractor by such agents immediately and in writing of any change in the name or names so submitted.

6.11 CHARACTER OF WORKMEN, METHODS AND EQUIPMENT

The Contractor shall at all times provide adequate supervision and sufficient labor and equipment for prosecuting the several classes of work to full completion of the project in the manner and within the time required by the contract.

- A. Character and Proficiency of Workers. All workers must have sufficient skill and experience to perform properly the work assigned to them. All workmen engaged in special work or skilled work such as bituminous courses of mixtures, concrete pavement or structures, electrical installation, plumbing installation, or in any trade shall have sufficient experience in such work and in the operation of the equipment required to properly and satisfactorily perform all work. All workers shall make due and proper effort to execute the work in the manner prescribed by the Contract; otherwise, the Contracting Officer may take action as prescribed herein. Any worker employed on the project by the Contractor or by any subcontractor who, in the opinion of the Contracting Officer, is not careful and competent, does not perform his work in a proper and skillful manner or is disrespectful, intemperate, disorderly or neglects or refuses to comply with directions given, or is otherwise objectionable shall at the written request of the Contracting Officer, be removed forthwith by the Contractor or subcontractor employing such worker and shall not be employed again in any portion of the work without the written consent of the Contracting Officer. Should the Contractor or subcontractor continue to employ, or again employ such person or persons on the project, the Contracting Officer may withhold all monthly payments which are or may become due, or the Contracting Officer may suspend the work until such orders are complied with, with no adjustment in contract end date being made.

- B. **Insufficient Workers.** In the event that the Contracting Officer, in his judgment, finds the condition whereby insufficient workers are present to accomplish the work and no corrective action is taken by the Contractor after being informed, the Contracting Officer reserves the right to terminate the contract as provided for under Section 8 REMEDIES.

- C. **Equipment Requirements.** All equipment furnished by the Contractor and used on the work shall be of such size and of such mechanical condition that the work can be prosecuted in an acceptable manner at a satisfactory rate of progress and the quality of work produced will be satisfactory.

Equipment used on any portion of the project shall be such that no injury to the work, adjacent property or other objects will result from its use. If the Contractor fails to provide adequate equipment for the work, the contract may be terminated as provided under Section 8 REMEDIES.

In the event that the Contractor is paid for furnishing and operating equipment on a force account basis, it shall be operated as directed by the Contracting Officer in order to obtain maximum production under the prevailing conditions.

6.12 WAGES AND HOURS

Contractors shall observe and comply with all the provisions of Chapter 104, HRS, relating to wages and hours of employees on public works. The contractor shall pay all employees on any contract with the Department, the minimum basic wage rate in conformance with applicable Federal and State laws.

The minimum wages shall be periodically increased during the performance of a contract in an amount equal to the increase in the prevailing wages for those kinds of work as periodically determined by the State Director of Labor and Industrial Relations. Notwithstanding the provisions of the original contract entered into, if the Director of Labor and Industrial Relations determines that the prevailing wage has increased, the rate of pay of laborers and mechanics on the contract shall be raised accordingly. Offerors shall take into consideration increases which may occur during the period of the contract in computing their bid or proposal prices. No additional compensation shall be made for failure to do so.

The current State Wage Rate Schedule and any addenda is incorporated in this document by reference only. Copies are available the State Department of Labor and Industrial Relations, 830 Punchbowl Street, Honolulu, HI 96813, or at the State website:

<http://hawaii.gov/labor/rshttp://labor.hawaii.gov/wsd/files/2013/02/104-2FAQ-Rev-3-09.pdf>

No labor or mechanic employed on the job site shall be permitted or required to work on Saturday, Sunday, or a legal holiday of the State of Hawai'i in excess of eight (8) hours on any other day unless the laborer or mechanic receives overtime compensation for all hours worked on Saturday, Sunday, and a legal holiday of the State or in excess of eight (8) hours on any other day. For purposes of determining overtime compensation under this subsection, the basic hourly rate of any laborer or mechanic shall not be less than the basic

hourly rate determined by the Director of Labor and Industrial Relations to be the prevailing basic hourly rate for corresponding classes of laborer and mechanics on projects of similar character in the State.

A certified copy of all payrolls shall be submitted weekly to the Manager. The contractor shall be responsible for the submission of certified copies of the payrolls of all subcontractors. The certification shall affirm that the payrolls are correct and complete, that the wage rates contained therein are not less than the applicable rates contained in the wage determination decision of the Director of Labor and Industrial Relations attached to the contract, and that the classifications set forth for each laborer or mechanic conform with the work the laborer or mechanic performed.

If the Contracting Officer finds that any laborer or mechanic employed on the job site by the contractor or any subcontractor has been or is being paid wages at a rate less than the required rate by the contract or the specifications, or has not received the laborer's or mechanic's full overtime compensation, the Contracting Officer may take appropriate action in accordance with Section 104-4, HRS, or the Contracting Officer may, upon recommendation of the Contracting Officer, by written notice to the contractor, terminate the contractor's right, or the right of any subcontractor, to proceed with the work or with the part of the work in which the required wages or overtime compensation have not been paid and may complete such or part by contract or otherwise, and the contractor and the contractor's sureties shall be liable to the Department for any excess costs occasioned thereby.

The contractor is required to post the applicable wage schedule in a prominent and easily accessible place at the job site. The contractor shall give to each laborer and mechanic employed under the contract a copy of the rates of wages required to be posted.

On federally funded or federally assisted projects, the current federal wage rate determination in effect at the time of advertising for bids or proposals is incorporated as part of the invitation for bids or proposals, and both State and federal wage rates shall apply. Where rates for any class of laborers and mechanics differ, the higher rates shall prevail. The minimum federal wage rates shall be those in the U.S. Department of Labor Wage Determination Decision and Modifications in effect five (5) calendar days prior to the bid or proposal opening date.

6.13 CONTRACTOR'S ADDRESS

The contractor shall provide and maintain a post office address within the State of Hawai'i and file the same with the Contracting Officer. Any written order or notice which may be required or desirable under the contract may be served on the contractor personally, or delivered to his or her representative on the project site, or left with a member of his or her family of suitable age and discretion at his or her residence, or with any employee of the contractor at his or her place of business and/or mailed to the aforesaid local post office address. All orders or notices shall become effective when mailed or at the time of service or delivery as aforesaid.

6.14 OBSTRUCTIONS

The Contractor shall remove all obstructions, the removal of which shall be necessary for the proper reception, performance, construction, installation, and completion of all work under this contract, as called for or implied in the plans and specifications, and is considered incidental work.

6.15 SURVEYS AND CONSTRUCTION STAKES, LINES AND GRADES

All lines, levels and elevations are to be laid out and checked by a surveyor or civil engineer licensed in the State of Hawai'i at the contractor's expense. The contractor shall furnish a certificate or document signed by the surveyor or civil engineer certifying that the completed lines, levels and elevations are in conformity with the contract. The contractor shall verify all lines, levels and elevations indicated in the contract before any excavation or construction begins. Any discrepancy shall be immediately brought to the attention of the Manager and any change shall be made in accordance with his or her instruction. The contractor shall not be entitled to any additional payment if he or she fails to report the discrepancies before proceeding with work within the area affected by the discrepancies.

6.16 SUBCONTRACTING

The contractor shall not subcontract any part of the contract except to those subcontractors specifically listed in the bid or proposal submitted by the contractor; provided, however, the contractor may for good cause and upon written approval of the Contracting Officer engage other subcontractors. Engaging subcontractors to perform the work under the contract shall not relieve the contractor of his or her duty to perform the contract in accordance with the terms, covenants, conditions, provisions and intent thereof. The contractor shall replace a subcontractor when required by the Contracting Officer for not performing the contract in accordance with the terms, covenants, conditions, provisions and intent thereof.

6.17 OTHER CONTRACTS

The contractor shall coordinate his or her operations with those of other contractors who may be employed on adjacent or related projects of the State, County, Department or private development, shall avoid interference therewith, and shall cooperate with the other contractors so as to avoid unnecessary delay or hindrance in the performance of their respective contracts. Any difference or conflicts which may arise between the contractor and other contractors of the State, County, Department or private development in regard to their projects shall be adjusted and determined by the Department's staff, whose decision and order shall be final and binding.

6.18 WATER REMOVAL

The contractor shall examine the site of the project and make all necessary arrangements with affected property owners for the removal of water from the site. The contractor shall provide a bridge or other facilities to prevent water flowing into adjacent properties and adjacent streets as a result of his or her activities, from interfering with the traffic on such streets.

6.19 ELECTRICAL, TELECOMMUNICATION AND WATER SERVICE

The contractor shall make his or her own arrangements for electrical, telecommunication and water services required for the performance of the contract at his or her expense. The Contractor shall be responsible for scheduling and coordinating the work with the utility companies and applicable governmental agencies for temporary and permanent service connections. The Contractor will pay the utility companies and applicable governmental agencies directly for such connections upon receipt of the state of charges.

The contractor or subcontractor will not be charged for the final filling of any new or refurbished tank if a temporary hydrant meter is used. For example, a new or refurbished 0.5 MG Tank will be credited 500,000 gallons. All other usage of the temporary hydrant meter such as, but not limited to, testing of new waterlines, irrigation, and dust control will be charged to the contractor.

6.20 UTILITIES UNDERGROUND

Prior to offer: All underground waterlines and appurtenances, gas, oil, telephone, television, electric, storm drain, fiber optic, sewer and other pipes or conduits, if shown on the plans, are only approximate in their locations. Prior to bid or proposal, the contractor shall make a personal investigation and inspection of the records of the owners of the utilities, supplemented by actual digging in the field, if necessary, to determine the actual locations of such utilities with all their branch and service lines whether indicated on the plans or not. Consequences resulting from the Contractor's failure to do so will be the sole cost and responsibility of the Contractor.

Prior to installation of new facilities: The contractor shall make satisfactory arrangements with the owners of the utilities for the relocation, maintenance and protection of existing utilities and shall furnish the Department's staff with evidence in writing that satisfactory arrangements have been made not less than ten (10) days before the commencement of the parts of the project under the contract affecting such utilities. Further, the Contractor shall probe the project area to verify existing utilities shown or not shown on the approved construction drawings and indicate potential conflicts with new facility installation. If required, the Department will consider redesign of the new facilities to deal with the potential conflicts. Consequences resulting from the Contractor's failure to do so will be the sole cost and responsibility of the Contractor.

6.21 QUALITY OF MATERIALS AND EQUIPMENT

Unless otherwise specifically stated in the specifications, all workmanship, equipment, materials and articles incorporated in the work covered by this contract are to be of the best available grade of their respective kinds. Whenever specifications for any material, article, device, product, fixture, form, type of construction or process is indicated or specified by patent or proprietary name, by name of the manufacturer or by catalog number, such specifications shall be deemed to be used for the purpose of establishing a standard of quality and to facilitate the description of the material or process desired and shall be deemed to be followed by the words "or equal."

All materials and equipment furnished and installed under this contract shall be new and must be of standard quality of their respective kinds, free from all defects which may render them unfit for use. The contract contemplates the use of first-class materials and equipment

throughout the performance of the contract, and it is agreed that any material and equipment for which no particular specification is given shall be of the highest quality of its class or kind. The Manager will not accept materials and equipment that do not conform to the contract.

Rejected materials and equipment shall be removed immediately from the work and replaced with materials and equipment of the required quality. Should the contractor fail to remove such rejected materials and equipment within twenty-four (24) hours after notice by the Contracting Officer, the latter may remove such rejected materials and equipment and deduct the expense therefor from any sum due or to become due the contractor. Failure to reject any material and equipment or to remove any rejected material and equipment shall not relieve the contractor from responsibility as to the quality and character of materials and equipment used or as to any other obligation imposed upon him by the contract.

6.22 NATIONAL SANITATION FOUNDATION (NSF) APPROVALS

All materials used in Waterworks construction (pipe, pipe lubricants, paints, sealants, form oil, concrete admixtures, etc.) in direct contact with the potable water shall be approved by the National Sanitation Foundation (NSF). The contractor shall submit these approvals to the Contracting Officer for review and approval prior to its application.

6.23 SAMPLES

Whenever requested by the Contracting Officer, the contractor shall furnish samples of materials to be used in the performance of the contract. Said samples if approved, will be retained by the Contracting Officer and, subject to his or her order, shall be used as the standard with which all like materials furnished under the contract must conform. The approval of any sample tested by the Contracting Officer or his or her failure to require the furnishing of samples shall not relieve the contractor from performing the work in accordance with the contract.

6.24 PROTECTION OF PEDESTRIANS AND VEHICULAR TRAFFIC

During the progress of the work, the contractor shall use all proper precautions and methods of procedure and construction by means of good and sufficient barriers, guards, temporary bridges, notices, lights, warning and other safeguards for the prevention of accidents and for the protection of persons and property, and from sunset until sunrise he or she shall keep suitable lights burning wherever the public has access near or at the work in progress to define the line of safe passage. The Contractor shall defend, indemnify and save harmless the Department and Board against any and all suits, actions and claims for cost, compensation, damages or otherwise to which the said Department may be put on account of injury to person or property of another, resulting from negligence of the contractor in the performance of the work or the guarding of the same; and he or she shall include in his or her bond such terms as will protect the Department and Board against any loss, charge or expense by reason of any such claims, suits or actions.

A. Public Convenience.

The contractor shall so conduct his or her operations as to offer the least possible obstruction and inconvenience to the public and he or she shall have under

construction no greater length or amount of work than he or she can prosecute properly with due regard to the rights of the public.

Unless otherwise provided in the special provisions, all public traffic shall be permitted to pass through the work with as little inconvenience and delay as possible.

Spillage resulting from hauling operations along or across any public travel way shall be removed immediately by the contractor at his or her expense.

Construction operations shall be conducted in such a manner as to cause as little inconvenience as possible to abutting property owners.

Convenient access to driveways, houses, mail boxes and buildings along the line of the work shall be maintained and temporary approaches to crossings or intersecting highways shall be provided and kept in good condition.

Water or dust palliative shall be applied if ordered by the Manager for the alleviation or prevention of dust nuisance at all times, regardless of whether or not work is being performed on the site.

B. Public Safety

The contractor shall comply with all requirements and provisions of the Federal, State and County safety laws, including Hawai'i Occupational Safety and Health (OSHA) Laws, and all building and construction codes, and shall take all necessary precautions for the safety of all employees on the project.

Wherever the contractor's operations create a condition hazardous to traffic or to the public, he or she shall furnish, erect and maintain, at his or her expense and without cost to the Department, such fences, barricades, lights, signs and other devices as are necessary to prevent accidents or damage or injury to the public.

Should the contractor appear to be neglectful or negligent in furnishing warning and protective measures as above provided, the Contracting Officer may direct attention to the existence of a hazard and the necessary warning and protective measures shall be furnished and installed by the contractor at his or her expense.

Should the Contracting Officer point out the inadequacy of warning and protective measures, such action on the part of the Contracting Officer shall not relieve the contractor from responsibility for public safety or abrogate his or her obligation to furnish and pay for these devices.

The installation of general roadway illumination shall not relieve the contractor of his or her responsibility for furnishing and maintaining any of the protective facilities hereinbefore specified.

C. Accidents.

The contractor must promptly report in writing to the Manager all accidents whatsoever arising out of or in connection with the performance of the work,

whether on or adjacent to the site which caused death, personal injury or property damage, giving full details and statements of witnesses. In addition, if death or serious injuries or serious damage is caused, the accident shall be reported immediately by telephone or by messenger to the Manager.

If any claim is made by anyone against the contractor or any subcontractor on account of any accident, the contractor shall promptly report the facts in writing to the Manager, giving full details of the claim. It is understood and agreed that the written report of any accident shall not relieve the contractor of the responsibility, and the Department and Board shall not be held responsible.

D. Non-compliance.

The Manager will notify the contractor of any non-compliance with the foregoing provisions and the action to be taken. If the contractor fails or refuses to comply promptly, the Contracting Officer, with the approval of the Contracting Officer, may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No extension of time or payment for excess costs or damage shall be made for the time lost due to such stop action.

If no corrective action is taken by the contractor within twenty-four (24) hours after a suspension is ordered by the Contracting Officer, the Department reserves the right to take whatever action is necessary to correct the situation and to deduct all costs incurred by the Department in taking such action from moneys due the contractor.

The Contracting Officer may also suspend any operations which he or she feels are creating safety problems. The Department's failure to act pursuant to this section shall not be considered a liability and failure on the Department's part to act shall not be considered a waiver to any rights and remedies to which the Department is entitled.

6.25 ACCESS TO PROPERTY

The contractor shall provide safe access to the property abutting the site of the project when the usual means of access are obstructed by the performance of the contract.

6.26 PROJECT SIGN

The contractor shall provide signs to identify the project. The signs shall be erected at locations designated by the Contracting Officer at the site of the project upon commencement of the work under the contract. Signs shall be properly erected and kept clean and legible. After completion of the work under the contract and final acceptance thereof, the contractor shall remove the signs.

The Contractor shall assume all responsibilities in maintaining the sign in good legible condition and free from any damage during the entire construction period, and shall make good all such repairs at no cost to the Department.

6.27 PROJECT MAY BE PLACED IN SERVICE

The Department may place parts of the project in service as completed and the contractor shall give proper access to such portions for this purpose. Use of the portions so placed in service by the public shall constitute an acceptance by the Department of such portions of the project involved but shall not constitute total completion nor shall it constitute final acceptance . The Department does not recognize the concept of substantial completion to avoid liquidated damages.

6.28 PRECAUTIONS AND RESTORATION

The contractor shall protect property adjacent to the site of the project from damage and shall restore property damaged by him to the condition it was in prior to the damage. Prior to starting any work, the contractor shall photograph and video the existing conditions of structures, landscaping, etc. that are to remain within the project and any staging areas. Any existing defects, damages, etc. shall be noted and forwarded in writing to the Department of Water. Any damage to existing items noted during or after completion of the project that were not specifically reported in writing prior to starting any work shall be repaired and replaced by the contractor at no cost to the Department.

A. Existing Utilities and Structures.

The existence and location of underground utilities and structures as shown on the plans are from the latest available data but are not guaranteed as to their actual existence or location. Other obstacles not shown on the plans may be encountered in the course of the work.

The contractor shall make a personal investigation and inspection of the records of the owners of the utilities, supplemented by actual digging in the field if necessary to determine the actual locations of such utilities with all their branch and service lines whether indicated on the plans or not. The contractor shall furnish the Manager with written evidence that the contractor has contacted all the utility companies.

The contractor shall be held responsible for any damage to and for the maintenance and protection of existing utilities and structures whether shown on the plans or not.

The contractor shall also completely protect all buildings, pavements, gutters, curbs, sidewalks, driveways, walls, fences, pipes, drains, conduits, or other structures of all classes, nature or types from settlement or other damage by installing proper underpinning, sheet piling and bracing and by taking all proper precautions during the period of construction. The contractor shall be responsible for the settlement of any pavement, building or any other structure of any class, nature or type caused by the dewatering of trenches or from any other cause relative to the work of the contractor and he or she shall in all cases be held liable for any damage to any building, structure or property along the line of the work.

Should it become necessary to remove, replace, obstruct, alter or use any existing pipe, hydrant, conduit, pole or other equipment or structure of any kind, the contractor shall make all necessary arrangements with the Department, State, County, corporation, company or any other organization owning or controlling the same relative to the removal, replacement, obstruction, alteration, use, damage and the payment therefor and shall furnish the Contracting Officer with evidence in

writing that satisfactory arrangements have been made, not less than ten (10) calendar days before removing, replacing, altering, using or obstructing the equipment or structure concerned.

B. **De-watering.**

De-watering shall be accomplished by suitable means; this includes the Contractor obtaining the required NPDES permits for de-watering. The contractor shall repair any and all damages resulting to improvements from such de-watering operation to the satisfaction of the owners of such improvements.

C. **Grass.**

When grassed areas are disturbed, the area shall be carefully graded and replanted with similar grass placed not over 6"x 6" center to center, leaving the area substantially similar to the condition it was in prior to the excavation.

D. **Trees, Plants and Shrubbery.**

All trees shall be carefully protected and kept from contact with excavation or other materials. Where it is necessary to trim trees, plants or shrubs, the contractor shall employ licensed tree trimmers. Branches shall be carefully trimmed so that the trees, plants or shrubs are not damaged. All cut sections of branches shall be painted with tree seal compound. All grass, plants, trees or shrubs removed or destroyed shall be replaced by the contractor to the satisfaction of the Department, corporation, company or any other organization owning or controlling the area where this work is to be done. All costs thereof shall be considered incidental.

E. **Property Marks.**

The contractor shall reference and replace marks, stakes, pipes, monuments of the property line and similar objects which may be disturbed by the contractor while performing the contract.

F. **Environmental Pollution Control.**

The contractor shall comply with the following requirements for pollution control in performing all construction activities. The contractor shall be responsible for conformance to all federal, state and county laws regarding environmental pollution control, including Chapters 37 and 37-A the Public Health Regulations, Department of Health, State of Hawai'i, as amended, during construction.

1. **Erosion and Sediment Control.**

- a. Soil protection facilities shall be completed as early as practicable. Sections of bare earth and the length of their exposure to erosion shall be minimized by proper scheduling and limiting the work areas. Temporary berms, cut-off ditches, and other provisions which may be required because of the contractor's method of operation shall be installed at no cost to the Department. Also, the contractor shall continue such measures until establishing the protective ground cover sufficiently to be an effective erosion deterrent. If material begins to erode into a river, stream or impoundment, the contractor shall act immediately to bring the situation under control.

Surface drainage from cuts and fills within the construction limits and from borrow and waste disposal areas shall, if turbidity producing materials are present, be held in suitable sedimentation ponds or shall be graded to control erosion within acceptable limits.

The contractor shall restrict construction operations in rivers, streams, lakes and reservoirs where channel changes are shown in the contract. Also, the contractor shall restrict construction operations to those areas that are entered for the construction of temporary or permanent structures. The contractor shall clear rivers, streams, lakes and reservoirs promptly of water pipes, fittings, false work, piling, drill cuttings, debris, or other obstructions.

The contractor shall not deposit excavated material in or near rivers, streams, lakes and reservoirs and shall at all times comply with the Federal Clean Water Act, 33 U.S.C. §1251 et seq. and any other applicable laws.

The contractor shall not permit fording of streams with construction equipment. The contractor shall use temporary bridges or other structures wherever stream crossings are necessary. The contractor shall not operate mechanized equipment in streams except to construct channel changes and temporary or permanent structures. The contractor shall avoid or minimize interferences with the movement of migratory fish.

2. Landscape Preservation, Forest and Well Source and Water Facilities Protection.

The contractor shall conform to Federal, State and County laws, statutes, ordinances, rules and regulations, including the Department of Water and Fire Department, State Department of Land & Natural Resources governing the protection of forests, well sources and water sheds, and the performance of work in these areas.

The contractor shall keep the project area in an orderly condition, dispose refuse, and obtain permits for the construction and maintenance of Department's water facilities and appurtenances according to the State Forester requirements.

The contractor shall take precaution and assist in preventing and suppressing forest fires. The contractor shall notify a Forest official of the location and amount of fire.

The contractor shall avoid or minimize disturbance to game preserves, water sheds and operations of the State Forester and Department of Water.

3. Waste Disposal.

a. Care shall be exercised to insure that disposal of waste from construction operations do not create pollution problems.

- b. Disposal of any materials, waste, effluent, trash, garbage, oil, grease, chemicals, etc., in areas adjacent to streams shall be subject to the approval of the Manager.
- c. No burning of debris and/or waste materials shall be permitted on the project site.
- d. No burying of debris and waste materials except for materials which are specifically indicated elsewhere in the bid or proposal document as suitable for backfill shall be permitted on the project site.
- e. All unusable debris and waste materials shall be hauled away to an appropriate off-site dump area. During loading operations, debris and waste materials shall be watered down to allay dust.
- f. Frequency of cleanup shall coincide with rubbish producing events.

4. Dust Control.

Dust, which could damage crops, orchards, cultivated fields, Department's water facilities, public and private facilities, business establishments and dwellings or cause nuisance to persons, shall be abated and control measures shall be performed at all times, including non-working hours, weekends and holidays. The cost for all dust control sprinkling shall be paid for by the contractor and shall extend for the entire period of construction. The contractor shall be held liable for any damage resulting from dust originating from his or her operations.

5. Waste Water.

Construction operations shall be conducted so as to prevent discharge or accidental spillage of construction water, pollutants, solid waste, debris and other objectionable wastes in surface waters and underground water sources.

6. National Pollutant Discharge Elimination System (NPDES) Permit and other Water Discharge Permits.

The contractor shall review and become familiar with the latest requirements of the NPDES Permit as issued by the State Health Department and all other necessary permits to discharge water into the waterways prior to bidding or proposing on this project. All inquiries for this permit shall be coordinated with the State Health Department.

Immediately after the award of the construction contract, the contractor shall meet with the Contracting Officer to complete the applications for a Department of Health NPDES Permit and for all other permits that may be required to discharge water into waterways. The Contractor shall be the duly authorized representative of the Department of Water as it relates to NPDES requirements.

Notice to proceed will not be delayed due to the contractor's inability to

meet NPDES Permit requirements in a timely manner.

See Exhibit N for Best Management Practices (BMP) inspection report to be used during construction as NPDES permit compliance verification. The BMP report shall be submitted on a weekly basis to the Contracting Officer.

7. Noise Control.

The Department of Health's Chapter II-46, Hawai'i Administrative Rules, Community Noise Control, establishes statewide noise rules on community noise.

This statewide noise rule complies with Chapter 342F, Hawai'i Revised Statutes, which states that the Director of Health shall present, control and abate noise pollution in the state.

In reference to construction activities, community noise permit applications are required for construction operations which exceed, or are anticipated to exceed noise standards established in the rules. The significance of the community noise permit is to allow for construction operations to exceed the noise standards, while allowing the Department of Health to monitor such activities to assure adequate protection of public health and welfare from adverse noise impacts.

The following activities related to construction operations are exempt from the provisions of the rules:

- a. Activities related to the emergency maintenance and repair of state and county highways, parks, and public utilities including but not limited to water, sewer, electric, gas, and telephone systems, provided the noise is confined to only the equipment in use.
- b. Backup alarm devices on any vehicle, where such device is required by federal or state occupational safety and health regulations.
- c. Construction and remedial activities related to the emergency repair of damages caused by natural disasters, including but not limited to tsunamis and hurricanes.

The contractor shall be responsible to obtain all permits and provide the Manager with a copy. The contractor shall pay for all applicable permit fees.

8. Others

- a. Whenever trucks and/or vehicles leave the site and enter surrounding paved streets, the contractor shall prevent any materials from being carried onto the pavements.
- b. Trucks hauling debris shall be covered as required by PUC regulations. Truck hauling fine materials shall be covered.

- c. No dumping of waste concrete will be permitted at the job site unless otherwise permitted in the Special Provisions.
- d. Except for rinsing of the hopper and deliver chute, and for wheel washing where required, concrete trucks shall not be cleaned on the job site.
- e. Except in an emergency, such as mechanical breakdown, all vehicle fueling and maintenance shall be done in designated areas. A temporary berm shall be constructed around the area when runoff can cause problems.
- f. Spray painting will not be allowed unless done by the “airless spray” process.

9. Payment

The cost of environmental pollution control shall not be considered incidental and shall be included in the price of offer for the various items of work.

G. Archaeological, Historical, and Burial Site Findings

Whenever the contractor encounters possible archaeological, historical or burial site findings, the contractor shall immediately suspend the operation and inform the Contracting Officer verbally and follow up with a written letter. The Contracting Officer will notify the proper authorities to evaluate such findings and decide the course of action.

The contractor shall not resume suspended operations without the prior written acceptance of the Manager. Delays resulting from the discovery, investigation, and handling of such findings shall extend the completion date. The Contracting Officer will govern suspensions of work according to subsection 8.3 of these General Provisions. Also, the contractor shall conform to Chapter 6E, H.R.S. relating to Historic Preservation, as amended.

Construction work and equipment shall remain within the right-of-way limits of this project.

The Archaeologist will decide the limits of the site. Also, the Archaeologist will decide, with the Manager, the best means for protecting the site from further disturbances which requires further investigation or salvage as determined by the State Historic Preservation Officer. Protection may include barricades, roping off, temporary fencing or other means.

H. Protection of Fish and Wildlife

The contractor shall at all times perform all work and take such steps to prevent any interference or disturbance to fish and wildlife. The Contractor shall be solely liable for any fees or costs associated with failure to take the proper and necessary steps to prevent such interference and agrees to defend, indemnify, and hold harmless the

Department from any actions arising out of the failure to take the proper and necessary steps to prevent such interference to fish and wildlife.

I. **Subcontractors**

Compliance with the provisions of this subsection by the subcontractors will be the responsibility of the contractor.

J. **Health and Safety Compliance**

1. **Safety Program.** The Contractor shall comply with chapter 396, HRS, relating to the standards of occupational safety and health and all applicable Federal, State and County laws and regulations, including but not limited to section 396-18, HRS, relating to safety and health programs for contractors for Department construction projects where the proposal amount is in excess of \$100,000.

2. **Responsibility.** The Contractor shall designate a responsible member of its organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Contracting Officer.

3. **Safeguards, Signs.** The Contractor shall erect and maintain, as required by existing conditions and performance of the contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying owners and users of adjacent sites and utilities.

4. **No Loading.** The Contractor shall not load or permit any part of the construction or site to be loaded so as to endanger its safety.

5. **Emergency.** In an emergency affecting safety of persons or property, the Contractor shall act, at its discretion, to prevent threatened damage, injury or loss. The Contractor shall notify the Contracting Officer in writing of such emergency and remedial steps taken as soon as reasonably feasible. Additional compensation or extension of time claimed by the Contractor on account of an emergency may be considered by the Department.

K. **Non-compliance**

The Contracting Officer will notify the contractor of any non-compliance with the foregoing provisions and the action to be taken. If the contractor fails or refuses to comply promptly, the Contracting Officer, with the approval of the Contracting Officer, may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No extension of time or payment for excess costs or damage shall be made for the time lost due to such stop action.

If no corrective action is taken by the contractor within forty-eight (48) hours after a suspension is ordered by the Contracting Officer, the Department reserves the right to take whatever action is necessary to correct the situation and to deduct all costs incurred by the Department in taking such action from moneys due the contractor.

The Contracting Officer may also suspend any operations which he or she feels are creating pollution problems although they may not be in violation of the above-mentioned requirements. In this instance, the work shall be done by Force Account as described in Modification and Force Account provisions herein. The count of

elapsed working days to be charged against the contract in this situation shall be determined by the Contracting Officer upon recommendation of the Manager.

6.29 MAINTENANCE OF SITE, CONTROL OF DUST, AND FINAL CLEANUP

The contractor shall maintain the site of the project in an orderly and clean condition, and shall at suitable intervals and/or at the direction of the Manager, remove accumulations of rubbish or refuse materials, surplus Waterworks materials, concrete mortar, excavated materials and drill cuttings not required or suitable for backfill. Chlorinated water shall not be deposited in the drainage or sewer system of the County of Kaua'i. The contractor shall keep the site, inclusive of vehicular and pedestrian traffic routes through the site, free of dirt, and dust by periodic blading, power brooming, watering or other approve means to the satisfaction of the Manager.

Upon completion and before final acceptance of the work performed under the contract, the contractor shall remove excavated materials, drill cuttings, rubbish, surplus or discarded Waterworks materials, false work, forms, temporary structures, field offices, project signs, signs not a part of the project, and his or her equipment and machinery, and shall leave the site and ground occupied by him in connection with the performance of the contract in an orderly and clean condition. Waterworks facilities constructed, altered, or worked in by the contractor in the performance of the contract shall be left "broom clean," and stains and other blemishes resulting from his or her operations, such as dropped or splattered concrete or mortar and paints, grease or oil, shall be removed from floors, walls, ceiling, windows, Waterworks equipment, pipes, instruments and all other exposed surfaces. All applicable items in section 6.28 shall be completed during final cleanup within the project area. Failure to do so will be grounds for denying final acceptance of the project work and withholding final payment.

6.30 RESPONSIBILITY OF THE CONTRACTOR PRIOR TO ACCEPTANCE

The contractor shall repair, reconstruct, restore and replace the work or any part thereof which is injured or damaged, whatever cause, prior to acceptance of the work by the Manager.

Use by the public without permission of the Department shall not in any way be construed as an acceptance of the work under the contract and shall not in any way relieve the contractor from his or her obligation under the contract. Use of parts of the project completed under the contract by the public with the approval of the Department shall constitute acceptance of such portion of such work by the Department but shall in no way be construed to relieve the Contractor from his or her remaining obligations under the contract and shall in no way be construed as final acceptance of the project as a whole. Use of parts of the project shall not prevent accrual of liquidated damages as laid out in the contract.

Final inspection will be given when all items laid out in the plans, specifications, addendum, punch list and any and all other contract documents are completed. If the Department provides the Contractor with a pre-final punch list of items, final inspection approval will not be given until those items are completed to the satisfaction of the Department. If applicable, failure to attain final approval and/or final acceptance of the

project will result in the accrual of liquidated damages.

All completed facilities that are damaged by the contractor or by his or her negligence to safeguard the facilities from construction activities shall be repaired by the contractor to the satisfaction of the Department or applicable agencies.

In case of suspension in the performance of the work under the contract from any cause whatsoever, the contractor in addition to being responsible for performing the work under the contract shall:

- A. Defend indemnify and save the Department and its officers and employees harmless from liability for any injury or damage occurring during the period that the performance of the contract is suspended.
- B. Be responsible for all materials and equipment delivered to the site of the project, including materials and equipment for which he or she has received partial payment.
- C. Properly store the materials and equipment which have been partially paid for by the Department or which have been furnished by the Department.
- D. Remove immediately as directed by the Contracting Officer all surplus materials, equipment and rubbish.
- E. Neatly and compactly store, only with the approval of the Contracting Officer, all materials and equipment on the site of projects that are not within public highways or streets.
- F. Provide suitable drainage and erect such temporary structures as are necessary to protect the project or parts of the project from damage, and damages to the Department personnel and public.

6.31 FINAL INSPECTION

The Contracting Officer shall make final inspection with representatives of other County or State agencies interested in the contract within seven (7) calendar days after the work performed under the contract is completed and the site of such work has been cleaned as provided in subsections 6.29 and 6.30. The completed project as-built plans shall contain items required in Exhibit M and shall be submitted to the Contracting Officer at the time of final inspection.

6.32 FINAL COMPLETION AND FINAL ACCEPTANCE

Final Completion is defined as when the work is fully completed and in accordance with the Contract Documents, including, without limitation, satisfaction of all punch list items.

In order to obtain a determination of Final Completion, Contractor shall notify the Contracting Officer in writing when the project is complete with no deficiencies and ready for Final Inspection.

Final inspection will be given when all items laid out in the plans, specifications, addendum, punch list and any and all other contract documents are completed. If the Contracting Officer provides the Contractor with a pre-final punch list(s) of items, Final Inspection will not be given until those items are completed to the satisfaction of the Contracting Officer. Final Inspection will be completed in accordance with section 6.31 above.

Final Acceptance is defined as obtaining a designation of Final Completion of the Work and submittal of all necessary documents, including where applicable, but not limited to the following:

1. All written warranties required by the contract.
2. All required "As-Built" drawings.
3. Complete weekly payrolls for both the General and Subcontractors.
4. Certificate of all applicable building permit inspections.
5. Final Report for Specialty Inspections.
6. Certificate of building occupancy as required.
7. Certificate of Soil and Wood Treatments.
8. Certificate of Water System Chlorination.
9. Certificate of Elevator Inspection, Boiler and Pressure Pipe installation.
10. Maintenance Service Contract and two (2) copies of a list of all equipment installed.
11. All operating and maintenance manuals for installed equipment and all associate training to be complete.
12. All other documents required by the Contract.

The Final Acceptance Date shall determine:

1. End of Contract time.
2. Commencement of all warranty periods.
3. Commencement of all maintenance services required in per the Contract.

Failure to attain Final Acceptance of the project will result in the accrual of liquidated damages in accordance with the Contract Documents.

Upon determination of Final Completion, the Contracting Officer will send written notification to the Contractor of the Final Acceptance Date via a Final Inspection of Water Facilities approval letter.

6.33 GUARANTEE OF WORK

- A. All work shall be guaranteed by the Contractor against defects resulting from the use of defective or inferior materials, equipment or workmanship for one year or as otherwise noted in the technical specifications from the date of Final Acceptance of the contract.
- B. If, within any guarantee period, repairs or changes are required in connection with the guaranteed work, which in the opinion of the OIC is rendered necessary as a result of the use of materials, equipment or workmanship which are inferior, defective or not in accordance with the terms of the contract, the Contractor shall within five (5) consecutive working days and without expense to the County commence to:
 - 1. Place in satisfactory condition in every instance all of such guarantee work and correct all defects therein; and
 - 2. Make good all damages to the building or work or equipment or contents thereof.
- C. Whenever a warranty on any product hereinafter specified exceeds one (1) year, this warranty shall become part of this contract thereof. The Contractor shall complete the warranty forms in the name of the County and submit such forms to the manufacturer within such time required to validate the warranty.

6.34 CLOSING CONTRACTS

In order to close a contract, the Contractor shall submit the final payment request and the applicable closing documents by the specified time. In the event that the Contractor should fail to comply with this request, the Contracting Officer may terminate the Contract. The pertinent provisions of **Section 8 REMEDIES** shall be applicable.

SECTION 7 - PAYMENT

7.1 PAYMENT

The contractor shall receive and accept the compensation provided in the contract as full payment for the performance of the contract.

For lump sum contracts, the contract price shall be the result obtained by first reducing the amount designated as the total sum bid or proposal in the award by the amount included therein for allowances and contingencies and adding thereto or deducting therefrom any extra cost or any reduction in cost, respectively, to the Department as a result of supplemental agreements in writing and written orders of the Contracting Officer pursuant to subsection 5.3.

For unit price contracts, the contract price shall be the sum results obtained by multiplying the number of units of such item(s) incorporated in the work under the contract by the unit price therefor. The unit price of an item shall be the amount therefor specified in the bid or proposal, provided that if the number of units of any item needed to perform the required work exceeds or is less than the number specified in the bid or proposal as the Department's estimate of quantity of units required by more than fifteen percent (15%), then a price adjustment shall be made in the unit price for the item by supplemental agreement or, at the option of the Contracting Officer, by first determining the cost of the item on the basis of a Force Account pursuant to subsection 7.4 and dividing the cost by the number of units of the item needed to perform the required work. (Auth: 3-125-10, HAR)

7.2 VARIATIONS IN ESTIMATED QUANTITIES

The quantities of the items in the offer form are approximate only, and the Department reserves the right to increase or decrease any of the quantities as the Contracting Officer shall deem necessary or advisable.

A. **Variations Requiring Adjustments.**

Where the quantity of a pay item in this contract is an estimated quantity and where the actual quantity of such pay item varies more than fifteen percent (15%) above or below the estimated quantity stated in this contract, an adjustment in the contract price shall be made upon demand of either party. The adjustment shall be based upon any increase or decrease in costs due solely to the variation above one-hundred fifteen percent (115%) or below eighty-five percent (85%) of the estimated quantity. If the quantity variation is such as to cause an increase in the time necessary for completion, the Contracting Officer shall, upon receipt of a timely written request for an extension of time, prior to the date of final settlement of the contract, ascertain the facts and make such adjustment for extending the completion date as in the judgment of the Contracting Officer the findings justify.

B. **Adjustment in Price.**

Any adjustment in contract price made pursuant to the paragraph immediately above shall be determined according to the price adjustment clause of this contract. (Auth: 3-125-10, HAR)

7.3 QUANTITIES AND MEASUREMENTS

All quantities of work to be completed under the contract shall be measured by the Contracting Officer. The contractor shall inform the Contracting Officer when measurements are required. These measurements shall be considered correct and final unless the contractor files a written protest demonstrating the existence of an error within ten (10) calendar days after receipt of such measurement data.

Quantities or measurements indicated in the bid or proposal, if any are given for the convenience of the contractor. It will be assumed that the lump sum bid or proposal and unit prices made by the contractor and the price agreed upon by him are based on a thorough knowledge of the existing conditions and the amount and kind of work to be performed. It is expressly understood and agreed by the contractor that quantities and measurements of the work to be done and the materials to be furnished under this contract which have been estimated, as given are approximate. The contractor further agrees and hereby understands that neither the Manager, Contracting Officer, the Department nor any of their representatives is to be held responsible if such estimated quantities and measurements shall not be found to be the same or even close to the actual quantities and measurements required for the work under the contract. The contractor will make no claim for anticipated profits, or for loss of profits because of a difference between the quantities or measurements of the work actually done, or of materials actually delivered, and the estimated quantities or measurements stated in the bid or proposal. If an error, omission or mis-statement shall be discovered in the quantities or measurements stated in the bid or proposal, the same shall not vitiate the contract, or release the contractor or his or her surety or sureties from performing the contract, or affect the price agreed to under the contract, or excuse the contractor from any of the obligations or liabilities under the contract, or entitle him to damages or compensation, except as provided herein.

7.4 FORCE ACCOUNT

In Force Account, the Department will pay for work done according to the following items:

A. **Labor.**

The contractor will receive the wage rate including fringe benefits for actual work engaged by the worker. Fringe benefits are the required amounts by collective bargaining agreement or other employment contract generally applicable to the classes of labor employed. The contractor shall submit the fringe benefits for each class in writing to the Manager for acceptance before the Force Account work begins. The contractor may include foremen when authorized by the Manager.

The Department will pay the contractor an amount equal to thirty-five percent (35%) of the actual labor cost to cover the contractor's and subcontractor's operating expense, indirect and direct overhead and profit.

The Manager will not allow for overtime compensation without the written acceptance of the Manager before performance of that work. For authorized overtime, the Manager will pay one and a half (1-1/2) times the hourly wage rate plus the actual hours of overtime for fringe benefits, and/or as required by collective bargaining agreement.

B. **Insurance and Tax.**

The contractor will receive the projected average rate for the required insurance and taxes including property damage, liability, worker's compensation insurance premiums, State unemployment contributions, Federal unemployment taxes and social security taxes, average tax rate and Medicare taxes. The Manager will add six percent (6%) to the insurance and tax.

The contractor shall submit the projected average rate for taxes and insurance premium for the applicable current year for acceptance by the Manager.

C. **Material.**

The contractor shall receive the actual cost of that material including transportation charges accepted by the Manager, delivered, and incorporated into the work. The Manager will add fifteen percent (15%) to the material cost to cover operating expense, direct overhead, and profit.

D. **Equipment.**

1. Machinery and equipment shall be in good working condition and suitable for the purpose for which the contractor plans to use the machinery and equipment. The Manager may reject any machinery which he or she deems unnecessary, inefficient or inadequate for the work to be performed under Force Account.

2. Individual pieces of equipment or tools having replacement value of two hundred dollars (\$200.00) or less are small tools. The Department will not make payments for small tools.

3. **Rental Rate.**

a. The Department will pay the rental rates at the per-hour rates by dividing the monthly rate for that machinery or equipment by one hundred seventy-six (176). These rental rates are in the "Rental Rate Blue Book for Construction Equipment Volume I" (Rental Blue Book). The Manager will use the edition for the period doing work. The rental rate includes the estimated operating cost per hour and the regional correction factor. The Manager shall review and accept the equipment for use.

b. If the Rental Blue Book does not have the particular type of equipment, the Manager and the contractor shall agree on the rates in writing before its use. This includes rental rates for contractor-owned trucks.

c. For trucks not owned by the contractor, the Hawai'i State Public Utilities Commission shall establish the rental rate. The Department will pay for these as a material item according to Sub-section 7.4.c.

d. The Department may allow rental rates that are higher than the "Rental Blue Book." The contractor will submit a request for such

higher rates in writing for acceptance before using such equipment.

- e. Rental rates include the cost of fuel, oil, lubricant, supplies, attachments, repairs, maintenance, tire wear, depreciation, and storage.
 - f. Rental rates for idle time.
 - i. Idle time is the time period in which the machinery and/or equipment designated for a specific Force Account work is not in use for the work. The time period shall be for a working day (8 hours).
 - ii. The Manager will pay for fifty percent (50%) of the monthly hourly rate excluding the estimated operational cost per hour per working day.
 - g. Rental rates for stand-by time.
 - i. Stand-by time is the time period in which the machinery and equipment are standing by for the specific Force Account work day. A work day shall not exceed eight (8) hours (stand-by time plus the operating time) unless the Manager authorizes the overtime.
 - ii. The Manager will pay at the monthly hourly rate including the estimated operational cost per hour per working day.
 - h. The Manager will pay for authorized overtime for each hour over the normal eight (8) hours shift work day, legal holidays, Saturdays, and Sundays.
4. The Department will only pay for hours worked. The Department will not pay for equipment due to breakdowns.
5. Less than thirty (30) minutes of operation is half (1/2) hour of operation.
6. The cost of transporting the equipment shall not exceed the rates established by PUC. If such rates are non-existent, the Manager will resolve the rates based on the rates charged by established haulers within the State.
7. Payment.
- a. Equipment on the Project Site.
 - i. The rental time shall be the time the equipment is in operation on the Force Account work. Also, the rental time includes the time required to move the equipment to the location of the Force Account and to return the equipment to the original location or to another location requiring no more

time than to return the equipment to its original location. If the contractor uses the equipment at the site of the Force Account work on other than such Force Account work, the Manager will not pay for moving time. Moving time will be paid at the monthly hourly rate including the estimated operational rate and the applicable regional correctional factor.

- ii. When moving the equipment by other than its own power, the Manager will allow loading and transporting costs instead of moving time. If the contractor uses the equipment at the site of the Force Account work on other than such Force Account work, the Manager will not pay for moving time.

Payment for the transporter, if owned by the contractor shall be on the monthly hourly rate including the estimated operational rate and the applicable regional correction factor. Payment for the transporter, if not owned by the contractor, shall be by invoice cost and paid under “material.”

The Manager will pay for the equipment at the rate of “idle time.”

b. Equipment Not on the Project Site.

- i. The Manager shall confirm the location from which the equipment is to move or transport.
- ii. If the contractor transports the equipment to the site for the exclusive use of the Force Account work, the Department will pay the cost of mobilizing and transporting the equipment from its original location to the site of the Force Account work. This includes loading and unloading. Also, the Manager will pay the cost of demobilizing and transporting the equipment back to its original location or to another location, whichever cost is less.
- iii. For self-propelled equipment, the Department will pay the cost of moving the equipment by its own power from its original location to the site of the Force Account work. Also, the Department will pay the cost of moving the equipment back to its original location or to another location, whichever cost is less.

The Manager will pay for the equipment at the monthly hourly rate including the estimated operational rate and the applicable regional correction factor.

The Manager will pay for the contractor-owned escort for the

self-propelled equipment at the monthly hourly rate including the estimated operational rate and the applicable regional correction factor. The Manager will pay for escort not owned by the contractor under material with an invoice.

- iv. If the contractor desires the return of the equipment to another location, the Department will pay the cost of transportation according to the above provisions, provided such payment does not exceed the cost of moving the equipment to the project site.
- v. If the contractor uses the equipment on the project site in ways other than on Force Account work, the Department will pay the cost of transporting the equipment to the job site. The contractor shall bear the cost of returning the equipment.
- vi. The Manager will begin the rental period at the time the equipment is unloaded at the site of work or at the time specified, whichever is later. The Manager will include each day that the machinery or equipment is at the site of the Force Account work. The rental period will terminate when the Manager orders the contractor to discontinue the use of the machinery or equipment.
- vii. If the equipment goes on stand-by because of delays in design, traffic, or other related problems uncontrollable by the contractor, the rental rate and rental period will be at the monthly hourly rate of not more than eight (8) hours per day.
- viii. If the equipment goes “idle” from the event of the previous work day, the Manager will make the rental rate and rental period under “idle time” excluding Saturdays, Sundays, and legal holidays until the Manager orders the contractor to discontinue or demobilize the machinery or equipment.

E. **Subcontracting.**

The contractor shall receive an additional amount equal to five percent (5%) of the total cost of that work computed as set forth above when the accepted subcontractors work on a Force Account basis.

F. **Bond.**

The Manager will add a bond allowance of one percent (1%) to the total sum determined in (A) through (E).

G. **State Excise Tax.**

The Manager will add a State Excise Tax (4.166%) to the total sum determined in (A) through (F) as stated in HRS 237.

The contractor shall consider the compensation as determined in (A), (B), (C), (D),

(E), (F), and (G) above to be payment in full for work done on a Force Account basis, including superintendence, overhead, use of non-rental tools and equipment, profit, taxes and subcontracting.

H. **Records.**

The authorized representative of the contractor and the authorized representative of the Manager shall verify and sign the Force Account worksheet each day for work done on a Force Account basis. These records shall be the basis for payment of the Force Account work.

I. **Statements.**

The Manager will not make payment for work done on a Force Account basis until the contractor submits duplicate, itemized statements of the cost of that Force Account work, as authorized by the Manager, and:

1. Title. Contract number, its name or with the subcontractor's name, date, project title, contract change order number, project number, item number and item description.
2. Labor. Name of worker, classification, quantity of workers, daily hours, unit, rate of pay, extension of each worker, the fringe benefits amount payable if there are fringe benefits, and the extension for its operating expense, overhead and profit.
3. Insurance Rate - Average Tax. Cost for property damage, liability, workmen's compensation insurance premiums, average tax rate of State unemployment contributions, Federal unemployment taxes and social security taxes.
4. Materials. Description of the material, quantity of material, prices, extensions, cost of transporting materials, wholesale tax, and the extension for its operating expense, overhead, and profit. Include the cost of transporting materials only if the prices of the materials do not reflect that cost.
5. Equipment. Equipment classification, quantity of equipment, daily hours, unit, rental rate, extension for each unit of machinery and equipment.
6. The contractor shall type or write the description of work done for the day. The contractor shall have an authorized representative sign the two (2) copies. The authorized representative will initial the copies if the signatures are from a copy machine.

The contractor shall accompany and support the statements by invoices for transportation charges and materials used. If materials used on the Force Account work are not specifically purchased for such work but the contractor took the material from its stock, the Manager may request verification of material payment instead of invoices. The contractor shall submit an affidavit certifying that:

- a. The contractor took such materials from his or her stock,
 - b. The contractor used the quantity claimed used, and
 - c. The price and transportation claimed represent the actual cost.
7. The Manager may make payments of the Force Account work individually by labor, materials and equipment with the compliance of each item.

7.5 PAYMENTS DURING PERFORMANCE OF WORK

The Contracting Officer, prior to the commencement of work under the contract will submit to the Contractor a schedule of values of the various parts of the work, including quantities, aggregating the total sum of the contract, made out in such form as the Contracting Officer and the contractor may agree upon, and, if required, supported by such evidence as to its correctness as the Contracting Officer, may direct. The schedule, as approved by the Contracting Officer, shall be used as a basis for payment under the contract.

The Contractor shall, not later than the last day of each month during the performance of the contract, make an estimate of the amount of work done in accordance with the contract during that month, deducting sufficient allowance for incomplete or unprotected work or to provide for any contingency for known defects or known damage to said work or for the necessity of performing any part of the work over again to cure such defects or damage.

The Department will retain five percent (5%) of the amount due under the contract to the contractor to insure the proper performance of the contract. After fifty percent (50%) of the contract is completed and progress of work is satisfactory, no additional sums for retainage shall be withheld. However, if progress of work is not satisfactory, the Department may continue to withhold as retainage, sums not exceeding five percent (5%) of the amount due the contractor. The Department will hold the retainage amount until completion, in an acceptable manner of all the work as indicated in the Plans and Specifications. The monthly estimate as ascertained hereinabove, less the retainage and previous payments, will be certified and paid to the contractor. The monthly estimates must be accompanied by an updated full performance schedule per section 6.2 and Hawai'i Residency Act 103B Compliance Form.

7.6 PAYMENT FOR DELIVERED MATERIALS

Unless the contractor submits a paid invoice for the materials, the Department will not make payment for materials under this subsection.

The Department may pay the contractor:

- A. The cost of accepted material to be incorporated in the work, and
- B. When the contractor delivers such materials to the project and stored in acceptable storage places near the project.

Also, the Department may pay the contractor:

- A. For cost of accepted materials furnished and acceptably stored in a fabricator's yard provided such storage yard is on Kaua'i and
- B. If the contractor furnishes evidence that the materials are for use on the project. The contractor shall not use that material elsewhere.

The Department will not exceed the bid or proposal price of that item for payments authorized in this subsection. The contractor shall not consider payment of the material as final acceptance. The contractor shall be responsible for those materials.

Payment for material does not relieve the contractor of his or her obligations to furnish material acceptable to the Manager and to incorporate properly the material into the project according to the contract.

The Department will not make material payment on living or perishable plant material.

7.7 FINAL INSPECTION - FINAL PAYMENT

After completion of all the work required under the contract and Final Acceptance, as defined in Section 6.32 thereof by the Contracting Officer, the contractor will be paid the balance due in accordance with the Manager's final estimate of the construction actually performed, provided that final payment will be made only with the approval of the Contracting Officer, and the written consent to the surety or sureties on the contractor's bond after receipt of a Tax Clearance certificate from the Director of Taxation of the State of Hawai'i and Internal Revenue Service as provided in Section 103-53, HRS, as amended, and certification from the Department that any and all outstanding bills of the Contractor and subcontractors due and owing to the Department are paid.

7.8 PROMPT PAYMENT BY CONTRACTORS TO SUBCONTRACTORS

A. Prompt Payment Clause

1. **Generally.** Any money paid to a contractor shall be disbursed to subcontractors within ten (10) days after receipt of the money in accordance with the terms of the subcontract; provided that the subcontractor has met all the terms and conditions of the subcontract and there are no bona fide disputes on which the procurement agency has withheld payment.
2. **Final payment.** Upon final payment to the contractor, full payment to the subcontractor, including retainage, shall be made within ten days after receipt of the money; provided that there are no bona fide disputes over the subcontractor's performance under the subcontract.
3. **Penalty.** The Contracting Officer or the contractor, as applicable, will be subject to a penalty of one and one-half percent (1.5%) per month upon outstanding amounts due that were not timely paid by the responsible

party under the following conditions. Where a subcontractor has provided evidence to the contractor of satisfactorily completing all work under their subcontract and has provided a properly documented final payment request as described in paragraph (4) herein, and:

- a. Has provided to the contractor an acceptable performance and payment bond for the project executed by a surety company authorized to do business in the State, as provided in section 103-32.1, HRS; or
 - b. The following has occurred:
 - i. A period of ninety (90) days after the day on which the last of the labor was done or performed and the last of the material was furnished or supplied has elapsed without written notice of a claim given to contractor and the surety, as provided for in section 103D-324, HRS; and
 - ii. The subcontractor has provided to the contractor, an acceptable release of retainage bond, executed by a surety company authorized to do business in the State, in an amount of not more than two (2) times the amount being retained or withheld by the contractor; any other bond acceptable to the contractor; or any other form of mutually acceptable collateral, then, all sums retained or withheld from a subcontractor and otherwise due to the subcontractor for satisfactory performance under the subcontract shall be paid by the Contracting Officer to the contractor and subsequently, upon receipt from the Contracting Officer, by the contractor to the subcontractor within the applicable time periods specified in paragraph (2) herein and section 103-10, HRS. The penalty may be withheld from future payment due to the contractor, if the contractor was the responsible party. If a contractor has violated paragraph (2) herein three (3) or more times within two (2) years of the first violation, the contractor shall be referred by the Contracting Officer to the contractors license board for action under section 444-17(14), HRS.
4. A properly documented final payment request from a subcontractor, as required by paragraph (3) herein, shall include:
- a. Substantiation of the amounts requested;
 - b. A certification by the subcontractor, to the best of the subcontractor's knowledge and belief, that:

- i. The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the subcontract;
 - ii. The subcontractor has made payments due to its subcontractors and suppliers from previous payments received under the subcontract and will make timely payments from the proceeds of the payment covered by the certification, in accordance with their subcontract agreements and the requirements of this section; and
 - iii. The payment request does not include any amounts that the subcontractor intends to withhold or retain from a subcontractor or supplier in accordance with the terms and conditions of their subcontract; and
- c. The submission of documentation confirming that all other terms and conditions required under the subcontract agreement have been fully satisfied.

The Contracting Officer shall return any final payment request that is defective to the contractor within seven (7) days after receipt, with a statement identifying the defect.

5. In the case of a construction contract, a payment request made by a contractor to the Contracting Officer that includes a request for sums that were withheld or retained from a subcontractor and are due to a subcontractor may not be approved under paragraph (3) herein unless the payment request includes :
- a. Substantiation of the amounts requested; and
 - b. A certification by the contractor, to the best of the contractor's knowledge and belief, that:
 - i. The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the contract;
 - ii. The subcontractor has made payments due to its subcontractors and suppliers from previous payments received under the contract and will make timely payments from the proceeds of the payment covered by the certification, in accordance with their subcontract agreements and the requirements of this section; and
 - iii. The payment request does not include any amounts that the contractor intends to withhold or retain from a

subcontractor or supplier in accordance with the terms and conditions of their subcontract.

The Contracting Officer shall return any final payment request that is defective to the contractor within seven (7) days after receipt, with a statement identifying the defect.

6. This section shall not be construed to impair the right of a contractor or a subcontractor at any tier to negotiate and to include in their respective subcontracts provisions that provide for additional terms and conditions that are requested to be met before the subcontractor shall be entitled to receive final payment under paragraph (3) herein; provided that any such payments withheld shall be withheld by the Contracting Officer. (HAR 3-125-23)

SECTION 8 - REMEDIES

8.1 DISPUTES

- A. The resolution of controversies or claims, by mutual agreement, in excess of \$50,000 shall be subject to prior written approval of the Manager. (HAR 3-126-27)
- B. All controversies between the Department and the contractor not exceeding \$50,000 which arise under, or are by virtue of, this contract and which are not resolved by mutual agreement, shall be decided by the Manager in writing, within ninety (90) calendar days after a written request by the contractor for a final decision concerning the controversy. For claims exceeding \$50,000, a decision will be issued ninety (90) calendar days after receipt of a written claim; provided that if a decision is not issued within ninety (90) calendar days, the Manager will notify the Contractor of the time within which such decision will be made. This additional time period will depend on the size and complexity of the claim and the adequacy of the Contractor's supporting data and other relevant factors. If the Manager does not issue a written decision within the specified time period, then the contractor may proceed as if an adverse decision has been received.
- C. All controversies involving claims asserted by the Department against the contractor which cannot be resolved by mutual agreement shall be the subject of a decision by the Manager.

The Manager shall immediately furnish a copy of the decision to the contractor, by certified mail, return receipt requested, or by any other method that provides evidence of receipt.

- D. Any such decision shall be final and conclusive, unless fraudulent, or unless the contractor brings an action seeking judicial review of the decision in the Fifth Circuit Court of the State of Hawai'i within six (6) months from the date of receipt of the decision.
- E. The contractor shall comply with any decision of the Manager and proceed diligently with performance of this contract pending final resolution by the Fifth Circuit Court of the State of Hawai'i of any controversy arising under, or by virtue of, this contract, except where there has been a material breach of contract by the Department; provided that in any event the contractor shall proceed diligently with the performance of the contract where the Manager has made a written determination that continuation of work under the contract is essential to the public health and safety. (Auth: 3-126-31, HAR)
- F. If a reduction in cost or extra cost to the Department is the result of a written order of the Manager pursuant to subsection 5.3 and/or 5.4 cannot be agreed, the amount of such cost shall be determined on the basis of a Force Account pursuant to subsection 7.4.

8.2 CLAIMS BASED ON ORAL DIRECTIVES

Not more than five (5) days after receipt of the written notice from the contractor that the contractor intends to treat an oral directive as a change order (in accordance with Section 5.3 herein), the Contracting Officer shall issue a change order for the subject work if the Contracting Officer agrees that it constitutes a change. If no change order is issued in the time established, it shall be deemed a rejection of contractor's claim for a change. If the contractor objects to the Contracting Officer refusal to issue a change order, it shall file a written protest with the Manager within thirty days after delivery to the Manager of the contractor's written notice of its intention to treat the oral order as a change. In all cases, the contractor shall proceed with the work. The protest shall be determined as provided in the disputes and claims section of the contract. (Auth: 3-125-16, HAR)

8.3 DEFAULT, DELAY AND TIME EXTENSIONS

A. **Default.**

If the contractor refuses or fails to perform the work, or any separable part thereof, with such diligence as will assure its completion within the time specified in this contract, or any extension thereof, fails to complete the work within such time, or commits any other substantial breach of this contract, and further fails within seven (7) days after receipt of written notice from the Contracting Officer to commence and continue correction of the refusal or failure with diligence and promptness, the Contracting Officer may, by written notice to the contractor, declare the contractor in breach and terminate the contractor's right to proceed with the work or the part of the work as to which there has been delay or other breach of contract. In the event, the Department may take over the work and perform the same to completion, by contract or otherwise, and may take possession of, and utilize in completing the work, the materials, appliances, and plants as may be on the site of the work and necessary therefore. Whether or not the contractor's right to proceed with the work is terminated, the contractor and the contractor's sureties shall be liable for any damage to the Department resulting from the contractor's refusal or failure to complete the work within the specified time.

B. **Liquidated damages upon termination.**

If fixed and agreed liquidated damages are provided in the contract, and if the Department so terminates the contractor's right to proceed, the resulting damage will consist of the liquidated damages for the time as may be required for final completion of the work.

C. **Liquidated damages in absence of termination.**

If fixed and agreed, liquidated damages are provided in the contract, and if the Department does not terminate the contractor's right to proceed, the resulting damage will consist of such liquidated damages until the contractor's work is completed and final acceptance given by the Department per section 6.32.

D. **Time extension.**

The contractor's right to proceed shall not be so terminated nor the contractor charged with resulting damage if:

1. The delay in the completion of the work arises from causes beyond the Contractor's control such as: acts of God; acts of the public enemy; acts of the Department, County, State and any other governmental entity in either a sovereign or contractual capacity; acts of another contractor in the performance of a contract with the Department; fires; floods; epidemics; quarantine restrictions; strikes or other labor disputes; freight embargoes; unusually severe weather; delays of subcontractors due to causes similar to those set forth above; or shortage of materials; provided, however, that no extension of time will be granted for a delay caused by the failure on the part of the contractor and/or subcontractor to diligently perform his or her duties as it relates to any governmental agency in a timely manner; provided further, however, that no extension of time will be granted for a delay caused by a shortage of materials, unless the contractor furnishes to the Manager proof that the contractor has diligently made every effort to obtain such materials from all known sources, and further proof that the inability to obtain the materials when originally planned did in fact cause a delay in final completion of the entire work which could not be compensated for by revising the sequence of the contractor's operations; and
2. The contractor, within ten (10) calendar days from the beginning of any such delay (unless the Contracting Officer grants a further period of time before the date of final payment under the contract), notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of the delay and extend the time for completing the work when, in the judgment of the Contracting Officer, the findings of fact justify such an extension.

The following is required in writing when notifying the Contracting Officer of any such delay:

- A. Justification/narrative
- B. Supporting documentation
 - i. RFI's, change orders, letters/notices
- C. Description of impact (list of affected activities)
- D. Time analysis impact to be included.

The Contracting Officer shall have twenty (20) working days to approve or deny such request.

3. Rainout days are not covered by items 1 and 2 above. All rainout days shall be requested by the contractor to the Contracting Officer on the same calendar day of the rainout. Failure by the contractor to make the request within the day of the rainout shall be grounds for denial of the rainout for that particular calendar day.

The following is required in writing when notifying the Contracting Officer of any such delay:

- A. Justification/narrative
- B. Description of impact (list of affected activities)
- C. Time analysis impact to be included.

The Contracting Officer shall have twenty (20) working days to approve or deny such request.

- E. **Any additional rights and remedies.** The rights and remedies of the Department provided in this claim are in addition to any other rights and remedies provided by law or under this contract.

8.4 SUSPENSION OF WORK

- A. The Contracting Officer may by written order, suspend the performance of the work, either in whole or in part for such periods as the Manager may deem necessary for any cause, including but not limited to:
 - 1. Weather or soil conditions considered unsuitable for prosecution of the work;
 - 2. Failure on the part of the contractor to:
 - a. Correct conditions unsafe for the general public or for the workers;
 - b. Carry out orders given by the Manager;
 - c. Perform the work in strict compliance with the provisions of the contract; or
 - d. Provide adequate supervision on the jobsite.
 - 3. Whenever a redesign that may affect the work is deemed necessary by the Contracting Officer;
 - 4. Unacceptable noise or dust arising from the construction even if it does not violate any law or regulation; or
 - 5. The convenience of the Department.
- B. Suspension of work on some but not all items of work shall be considered a “partial suspension”. Suspension of work on all items shall be considered “total suspension”. The period of suspension shall be computed from the date set out in the written order for work to cease until the date of the order for work to resume.
- C. In the event that the contractor is ordered by the Contracting Officer in writing as provided herein to suspend all work under the contract in accordance with the above paragraphs 3, 4, or 5, the contractor may be reimbursed for actual money expended towards the project during the period of suspension. No allowance will be made for anticipated profits.

- D. If the performance of all or any part of the work is, suspended, for reasons beyond the control of the contractor, an adjustment shall be made for any increase in the cost of performance of this contract (excluding profit) necessarily caused by such suspension, and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension:
1. To the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the contractor; or
 2. For which an adjustment is provided for or excluded under any other provisions of the contract.
- E. Claims for adjustment. Any adjustment in contract price made pursuant to this clause shall be determined in accordance with the provisions on changes and claims for adjustment. Claims for the compensation shall be filed in writing with the Manager within thirty days after the date of the order to resume work or the claims will not be considered. Together with the claim, the contractor shall submit substantiating documents covering the entire amount shown on the claim. The Manager shall take the claim under consideration and may make such investigations as are deemed necessary. The Contracting Officer shall be the sole judge as to the equitability of the claim and the Contracting Officer's decision shall be final.
- F. No adjustment. No provision of this subsection shall entitle the contractor to any adjustments for delays due to failure of surety, for suspensions made at the request of the contractor, for any delay required under the contract, for suspensions, either partial or whole, made by the Manager under the provisions in subparagraph A2. (Auth: 3-125-7, HAR)

8.5 TERMINATION OF CONTRACT - WORK MAY BE TAKEN OVER BY DEPARTMENT

The Department may terminate the contract, or require the work therein to be completed by the surety or sureties under the contractor's bond or take over such work as hereinafter provided without terminating the contract, if the contractor:

- A. fails to begin work under the contract at the time required,
- B. is unnecessarily delaying the performance of the contract or any part thereof,
- C. is failing to perform the contract with sufficient or adequate workmen, equipment or materials or is not making sufficient progress to ensure the completion of the contract within the time specified,
- D. fails to perform the contract in accordance with directions of the Manager,
- E. discontinues performance of the contract,

- F. fails to re-commence performance of the contract within a reasonable time after service of a written order to do so if the performance had been suspended,
- G. becomes insolvent or is declared bankrupt,
- H. commits any act of bankruptcy or insolvency,
- I. allows any final judgment to stand against him unsatisfied for a period of ten (10) days,
- J. makes an assignment for the benefit of creditors,
- K. fails to pay for all labor, tools, materials, and equipment,
- L. has been or is paying wages to any laborer or mechanic employed on the job site at a rate below the minimum rate specified in the contract,
- M. has failed to pay full compensation for overtime work by any such laborer or mechanic,
- N. has abandoned the performance of the contract,
- O. has made unjustifiable and substantive changes from the condition set forth in his or her original itemized bid or proposal,
- P. or violates or fails to perform the contract in accordance with the terms, covenants, conditions, provisions and intent thereof.

Whenever the Contracting Officer is not satisfied with the performance of the contract the Contracting Officer, with the approval of the Contracting Officer, may make specified orders as to the progress or conduct of such work, giving the contractor a definite period within which to comply with such orders; or whenever the contractor shall be in default in any particular requirement, the Contracting Officer, with the approval of the Contracting Officer Manager, shall serve the contractor, or its authorized representatives, with a written notice to remedy said default or any part thereof within fourteen (14) calendar days after notice thereof, serving copies of such notice to the surety or sureties of the contractor, as the case may be. If, after the expiration of the time of such notice, the contractor fails to comply with the notice, or the default continues, the Contracting Officer, with the approval of the Contracting Officer Manager, may order all payment under the contract to cease and the work to be discontinued. Upon such order the contractor shall discontinue the work. Failure on the part of the Department to order a discontinuance of the work or payment for the same shall in no event be construed as an acceptance of the work, nor as a waiver of any failure or any default. (Auth: 3-125-16, HAR [generally]).

Immediately upon or after ordering the contractor to discontinue the work, the Contracting Officer Manager may require the completion of the contract by the surety or sureties upon the contractor's bond, or (without prejudice to the Department to rely upon said bond), the Department's contract to a second contractor or contractors, or may direct DOW employees to enter upon the work and to use such materials, tools and equipment as he or she may find

upon the work and to procure labor, additional tools, materials and equipment for the completion of the work, and to complete said work in such a manner as he or she may deem advisable, and in such event the cost or expenses of completing the work and the delay resulting therefrom shall be a charge against the contractor and/or surety or sureties.

8.6 TERMINATION FOR CONVENIENCE

- A. Terminations. In addition to any other reason specified in subsection 8.5 above, the Contracting Officer may, with approval of the Manager, when the interests of the Department so require, terminate this contract in whole or in part, for the convenience of the Department. The Contracting Officer shall give written notice of the termination to the contractor specifying the part of the contract terminated and when termination becomes effective.
- B. Contractor's obligations. The contractor shall incur no further obligations in connection with the terminated work and on the date set in the notice of termination the contractor will stop work to the extent specified. The contractor shall also terminate outstanding orders and subcontracts as they relate to the terminated work. The contractor shall settle the liabilities and claims arising out of the termination of subcontracts and orders connected with the terminated work subject to the Department's approval. The Contracting Officer, upon recommendation by the Manager, may direct the contractor to assign the contractor's right, title, and interest under terminated orders or subcontracts to the Department. The contractor must still complete the work not terminated by the notice of termination and may incur obligations as necessary to do so.
- C. Right to construction and goods. The Contracting Officer may, upon recommendation by the Manager, require the contractor to transfer title and deliver to the Department in the manner and to the extent directed by the Contracting Officer:
1. Any completed constructions; and
 2. The partially completed construction, books, materials, parts, tools, dies, jigs, fixtures, plans, drawings, information, and contract rights (hereinafter called "construction material") as the contractor has specifically produced or specially acquired for the performance of the terminated part of this contract.

The contractor shall protect and preserve property in the possession of the contractor in which the Department has an interest. If the Contracting Officer does not exercise this right, the contractor shall use best efforts to sell the construction, goods, and construction materials in accordance with the standards of section 490:2-706, HRS. This in no way implies that the Department has breached the contract by exercise of the termination for convenience clause.

- D. Compensation.
1. The contractor shall submit a termination claim specifying the amounts due because of the termination for convenience together with cost or pricing data, submitted to the extent required by subchapter 15, chapter 3-122, HAR,

bearing on such claim. If the contractor fails to file a termination claim within one (1) year from the effective date of termination, the Contracting Officer, upon recommendation of the Manager, may pay the contractor, if at all, an amount set in accordance with subparagraph 8.6D3(b) of this subsection.

2. The Contracting Officer, upon recommendation of the Manager, and the contractor may agree to a settlement provided the contractor has filed a termination claim supported by cost or pricing data submitted as required and that the settlement does not exceed the total contract price plus settlement costs reduced by payments previously made by the Department, the proceeds of any sales of construction, goods, and construction materials under subparagraph 8.6D3(c), and the contract price of the work not terminated.
3. Absent complete agreement under paragraph 8.6D2 of this subsection, the Contracting Officer, upon notice from the Manager, shall pay the contractor the following amounts, provided payments under paragraph 8.6D2 of this subsection shall not duplicate payments under this paragraph the total (without duplication of any items) of:
 - a. The cost of all contract work performed prior to the effective date of the notice of termination work plus a five percent (5%) markup on actual direct costs on the portion of the work (the markup shall not include anticipatory profit or consequential damages) less amounts paid or to be paid for completed portions of the work; provided, however, that if it appears that the contractor would have sustained a loss if the entire contract would have been completed, no markup shall be allowed or included and the amount of compensation shall be reduced to reflect the anticipated rate of loss;
 - b. Subject to the prior approval of the Contracting Officer, the costs of settling and paying claims arising out of the termination of subcontracts or orders pursuant to “contractor’s obligations” provisions of this contract. Subcontractors shall be entitled to a markup of no more than ten percent (10%) on direct costs incurred to the date of termination.

These costs must not include costs paid in accordance with clause 8.6D3a.;
 - c. The total sum to be paid the contractor under this paragraph shall not exceed the total contract price reduced by the amount of any sales of construction, goods, and construction materials under subsection 8.3C, and the contract price of work not terminated.
4. Cost claimed, agreed to, or established under paragraphs 8.3D2 and 8.3D3 of this subsection shall be in accordance with chapter 3-123, HAR

8.7 COSTS OF COMPLETING CONTRACT

The contractor and/or his or her surety or sureties shall pay the Department for all costs incurred to complete the work under the contract if the Department takes the work out of the hands of the contractor pursuant to the provisions of Subsection 8.5, and for damages for any delay in the performance of the contract.

8.8 DAMAGES FOR DELAY

A. Liquidated Damages.

The amount of damage to the Department as a result of failure to complete the work under the contract within the time fixed or any extension thereof, exclusive of overhead expenses, being certain but difficult, if not impossible, to ascertain, the contractor agrees to pay the sum stated in the contract as liquidated damages, and not by way of penalty, for every day of delay until the work under the contract is completed and accepted, or a reasonable time has expired for completion and acceptance of the portion of the contract remaining to be performed if the Department takes the work under the contract out of the hands of the contractor.

8.9 DAMAGES FOR EXTRA EXPENSES IMPOSED ON DEPARTMENT

The contractor shall pay the Department for all the expenses incurred in re-doing any of the Department's obligations under the contract due to any actions or conduct of the contractor, including the replacing of marks or stakes set by the Manager.

8.10 DEFECTIVE WORK

Any defective work, workmanship or materials that may be discovered in the performance of the contract before its acceptance or within one (1) year thereafter as provided in the performance bond, shall be replaced by the contractor with work and materials that conform to the contract at no cost or expense to the Department. The fact that the Manager may have overlooked defective work during the performance of the contract shall not constitute the acceptance of the same. No payment, whether partial or final, shall be construed to be an acceptance of any defective work, workmanship or materials in the work performed under the contract.

The Contracting Officer may at any time, stop the performance of the contract or any portion thereof which is not being done in accordance with a contract by written order. Such order shall not in any way relieve the contractor from performing the contract and shall not in any way terminate, cancel or abrogate the contract or any part thereof; and the Department shall not in any way be responsible for the delay due to stopping the performance of the contract or any portion thereof as aforesaid.

The Contractor shall provide a warranty on the project work for one year after final inspection date as reflected in the final inspection letter.

8.11 UNAUTHORIZED PERFORMANCE

Performance of any work beyond the lines and grades shown on the plans or established by

the Contracting Officer or performance of any extra work without written order will be considered as unauthorized and will not be paid for. The Contracting Officer may require the removal of such work by service of a written order upon the contractor. If the contractor fails to comply promptly with such order, the Department shall remove such work and the contractor shall pay the Department for all expenses incurred in the removal of such work.

8.12 AUTHORITY TO WITHHOLD MONEY DUE OR PAYABLE

The Department may withhold such amounts from the money due or to become payable under the contract to the contractor, or any assignee under subsection 5.6, as may be necessary to:

- A. Protect the Department from any liability resulting from the work performed under this contract;
- B. Satisfy any obligation of the contractor or its subcontractors to the Department, including obligations not relating to the contract, and the obligation of the contractor to the workmen, subcontractors, and materialmen who have performed labor or furnished material and equipment under the contract as provided by law; and
- C. Repair, restore, or compensate for, any real or personal property located within the project site or in the vicinity thereof which has been damaged as a result of the fault or negligence of the contractor while performing the work under this contract; provided that the estimated amount of damages for each separate property shall not be in excess of five hundred dollars (\$500.00).

The Department may make such payments from such amounts withheld as may be necessary to cause the repair or restoration of the damaged properties or to compensate therefor, to discharge such obligation as provided under paragraph B above, and to protect the Department from any liability resulting from the work performed under this contract; provided, however, before making any payment for damages to property prescribed in paragraph C above, the Department through the Manager shall request the contractor in writing to undertake the repair or restoration of the damaged property or make compensation therefor. If the contractor fails or refuses to make such repair, restoration or compensation to the satisfaction of the Manager within thirty (30) calendar days after such notification, the Department may make the necessary payments.

8.13 SPECIAL EMERGENCY TERMINATION

In the event of a finding by the Manager and approved by the Contracting Officer that a national emergency exists which creates a shortage of materials, labor, or equipment and that such emergency will probably continue to exist for an indefinite length of time, or that funds are no longer available to the Department by reason of which the contractor will be unable to perform the work under the contract, the Department may cancel all remaining work required to be performed under the contract by written order.

Upon such cancellation, the Department shall pay the contractor the amount hereinafter provided. For lump sum contracts, an agreed upon price for the performance of the contract up to the time of cancellation, or at the option of the Manager, a price for such performance

determined on the basis of a Force Account pursuant to subsection 7.4. For unit price contracts, the sum of the results obtained by multiplying the number of units of each item incorporated into the parts of the project performed under the contract up to the time of cancellation by the unit price therefor. For both lump sum and unit price contracts, the contractor shall also be paid for such expenditures as in the judgment of the Manager are not otherwise compensated for and are require in the preparation and moving of equipment and materials to the site of the project, the intent being that an equitable settlement shall be made with the contractor. No claim for loss of anticipated profits, however, shall be made or considered.

Materials obtained by the contractor for the project, that have been inspected, tested, and accepted by the Manager, and that are not incorporated in the work under the contract, and which have been properly stored and maintained, will be purchased from the contractor at actual cost as shown by receipted bills or other proper evidence of actual cost at such points of delivery as may be designated by the Manager.

8.14 REMEDIES NOT EXCLUSIVE

The express provision herein of certain measures which may be exercised by the Department for its protection shall not be construed to preclude the Department from exercising any other or further legal or equitable right to protect its interest.

8.15 REMEDIES

Any dispute arising under or out of this solicitation or contract is subject to chapter 3-126, HAR. (Auth: 3-125-24, HAR)

APPROVED:



Manager & Chief Engineer

May 19, 2016
Date

EXHIBIT A – SURETY [BID][PROPOSAL] BOND

SURETY [BID] [PROPOSAL] BOND
(11/15/11)

Bond No. _____

KNOW TO ALL BY THESE PRESENTS:

That we,

(full name or legal title of offeror)

as Offeror, hereinafter called Principal, and

(name of bonding company)

as Surety, hereinafter called Surety, a corporation authorized to transact business as a Surety in the State of Hawai‘i, are held and firmly bound unto the Department of Water, County of Kaua‘i, as Owner, hereinafter called the Owner, in the penal sum of

(required amount of bid/proposal security)
Dollars (\$ _____), lawful money of the United States of America, for the payment of which sum well and truly to be made, the said Principal and the said Surety bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS:

The Principal has submitted an offer for _____

(project by number and brief description)

NOW, THEREFORE:

The condition of this obligation is such that if the Department of Water, County of Kaua‘i, shall reject said offer, or in the alternate, accept the offer of the Principal and the Principal shall enter into a Contract with the Department of Water, County of Kaua‘i, in accordance with the terms of such offer, and give such bond or bonds as may be specified in the solicitation or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof as specified in the solicitation then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed this _____ day of _____, 20____.

(Seal)

Name of Principal (Offeror)

Signature

Title
(Seal)

Name of Surety

Signature

Title

SURETY [BID] [PROPOSAL] BOND (EXHIBIT A)

EXHIBIT B – PERFORMANCE BOND (SURETY)

PERFORMANCE BOND (SURETY)

(11/15/11)

KNOW TO ALL BY THESE PRESENTS:

That

(full legal name and street address of Contractor)
as Contractor, hereinafter called the Principal, and

(name and street address of bonding company)
as Surety, hereinafter called Surety, a corporation(s) authorized to transact business as a Surety in the State of Hawai'i, are held and firmly bound unto the Department of Water, County of Kauai, its successors and assigns, hereinafter called Oblige, in the amount of

Dollars (\$ _____), to which payment Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above-bound Principal has signed a Contract with Oblige _____, for the following project:

hereinafter called Contract, which Contract is incorporated herein by reference and made a part hereof.

NOW, THEREFORE, the condition of this obligation is such that:

If the Principal shall promptly and faithfully perform, and fully complete the Contract in strict accordance with the terms of the Contract as said Contract may be modified or amended from time-to-time; then this obligation shall be void; otherwise to remain in full force and effect.

Surety to this Bond hereby assents and agrees that no changes, extensions of time, alterations, or additions to the terms of the Contract, including the work to be performed thereunder, and the specifications or drawings accompanying same, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such changes, extensions of time, alterations, or additions, and agrees that they shall become part of the Contract.

In the event of Default by the Principal, of the obligations under the Contract, then after written Notice of Default from the Oblige to the Surety and the Principal and subject to the limitation of the penal sum of this bond, Surety shall remedy the Default, or take over the work to be performed under the Contract and complete such work, or pay moneys to the Oblige in satisfaction of the surety performance obligation on this bond.

Signed this _____ day of _____, 20____.

(Seal)

Name of Principal (Contractor)

*

Signature

Title
(Seal)

Name of Surety

*

Signature

Title

*ALL SIGNATURES MUST BE ACKNOWLEDGED
BY A NOTARY PUBLIC

PERFORMANCE BOND (SURETY) (EXHIBIT B)

EXHIBIT C - PERFORMANCE BOND

PERFORMANCE BOND

(11/15/11)

KNOW TO ALL BY THESE PRESENTS:

That we,

(full legal name and street address of Contractor)
as Contractor, hereinafter called Contractor, is held and firmly bound unto the Department of Water, City of Kaua'i, its successors and assigns, as Obligee, hereinafter called Obligee, in the amount of

(dollar amount of contract)
DOLLARS (\$ _____), lawful money of the United States of America, for the payment of which to the said Obligee, well and truly to be made, Contractor binds itself, its heirs, executors, administrators, successors and assigns, firmly by these presents. Said amount is evidenced by:

- Legal tender;
- Share Certificate unconditionally assigned to or made payable at sight to _____
Description _____
- Certificate of Deposit, No. _____, dated _____, issued by _____ drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;
- Cashier's Check No. _____, dated _____, issued by _____, drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;
- Treasurer's Check No. _____, dated _____, issued by _____, drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;
- Official Check No. _____, dated _____, issued by _____, drawn on a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

PERFORMANCE BOND (EXHIBIT C)

- Certified Check No. _____, dated _____, accepted by a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned _____;

WHEREAS:

The Contractor has by written agreement dated _____ entered into a Contract with Oblige for the following Project:

hereinafter called Contract, which Contract is incorporated herein by reference and made a part hereof.

NOW, THEREFORE,

The condition of this obligation is such that, if Contractor shall promptly and faithfully perform the Contract in accordance with, in all respects, the stipulations, agreements, covenants and conditions of the Contract as it now exists or may be modified according to its terms, and shall deliver the Project to the Oblige, or to its successors or assigns, fully completed as in the Contract specified and free from all liens and claims and without further cost, expense or charge to the Oblige, its officers, agents, successors or assigns, free and harmless from all suits or actions of every nature and kind which may be brought for or on account of any injury or damage, direct or indirect, arising or growing out of the doing of said work or the repair or maintenance thereof or the manner of doing of the same or the neglect of the Contractor or its agents or servants or the improper performance of the Contract by the Contractor or its agents or servants or from any other cause, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

AND IT IS HEREBY STIPULATED AND AGREED that suit on this bond may be brought before a court of competent jurisdiction without a jury, and that the sum or sums specified in the said Contract as liquidated damages, if any, shall be forfeited to the Oblige, its successors or assigns, in the event of a breach of any, or all, or any part of, the covenants, agreements, conditions, or stipulations contained in the Contract or in this bond or in accordance with the terms thereof.

The amount of this bond may be reduced by and to the extent of any payment or payments made in good faith hereunder.

Signed this _____ day of _____, 20_____.

(Seal)

Name of Contractor

*

Signature

Title

*ALL SIGNATURES MUST BE ACKNOWLEDGED
BY A NOTARY PUBLIC

PERFORMANCE BOND (EXHIBIT C)

EXHIBIT D – LABOR AND MATERIAL PAYMENT BOND (SURETY)
LABOR AND MATERIAL PAYMENT BOND (SURETY)

(11/15/11)

KNOW TO ALL BY THESE PRESENTS:

That _____,
(full legal name and street address of Contractor)
as Contractor, hereinafter called Principal, and

(name and street address of bonding company)
as Surety, hereinafter called Surety, a corporation(s) authorized to transact business as a Surety in the State of Hawai'i, are held and firmly bound unto the Department of Water, County of Kaua'i, its successors and assigns, hereinafter called Oblige, in the amount of _____ Dollars (\$ _____), to which payment Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above-bound Principal has signed a Contract as Oblige on _____
for the following
project: _____,
hereinafter called Contract, which Contract is incorporated herein by reference and made a part hereof.

NOW THEREFORE, the condition of this obligation is such that if the Principal shall promptly make payment to any Claimant, as hereinafter defined, for all labor and material supplied to the Principal for use in the performance of the Contract, then this obligation shall be void; otherwise to remain in full force and effect.

1. Surety to this Bond hereby stipulates and agrees that no changes, extensions of time, alterations, or additions to the terms of the Contract, including the work to be performed hereunder, and the specifications or drawings accompanying same, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such changes, extensions of time, alterations or additions, and agrees that they shall become part of the Contract.

2. A "Claimant" shall be defined here as any person who has furnished labor or materials to the Principal for the work provided in the Contract.

Every Claimant who has not been paid amounts due for labor and materials furnished for work provided in the Contract may institute an action against the or she Principal and the Surety on this bond at the time and in the manner prescribed in Section 103D-24, Hawai'i Revised Statutes and have the rights and claims adjudicated in the action, and judgment rendered thereon; subject to the Oblige's priority on this bond. If the full amount of the liability of the Surety on this bond is insufficient to pay the full amount of the claims, then after paying the full amount due the Oblige, the remainder shall be distributed pro rata among the claimants.

Signed and sealed this _____ day of _____, 20____.
(Seal)

Name of Principal (Contractor)
*

Signature

Title
(Seal)

Name of Surety
*

Signature

Title

*ALL SIGNATURES MUST BE ACKNOWLEDGED
BY A NOTARY PUBLIC
LABOR AND MATERIAL PAYMENT BOND (SURETY) (EXHIBIT D)

EXHIBIT E - LABOR AND MATERIAL PAYMENT BOND

LABOR AND MATERIAL PAYMENT BOND (11/15/11)

KNOW TO ALL BY THESE PRESENTS:

That we,

(full legal name and street address of Contractor)

as Contractor, hereinafter called Contractor, is held and firmly bound unto the Department of Water, County of Kaua'i, its successors and assigns, as Obligee, hereinafter called Obligee, in the amount of

(dollar amount of contract)

DOLLARS (\$ _____), lawful money of the United States of America, for the payment of which to the said Obligee, well and truly to be made, Contractor binds itself, its heirs, executors, administrators, successors and assigns, firmly by these presents. Said amount is evidenced by:

- Legal tender;
- Share Certificate unconditionally assigned, payable at sight

Description _____
- Certificate of Deposit, No. _____, dated _____, issued by _____, drawn on _____, a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;
- Cashier's Check No. _____, dated _____, issued by _____, drawn on _____, a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;
- Teller's Check No. _____, dated _____, issued by _____, drawn on _____, a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;
- Treasurer's Check No. _____, dated _____, issued by _____, drawn on _____, a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

LABOR AND MATERIAL PAYMENT BOND
(EXHIBIT E)

- Official Check No. _____, dated _____, issued by _____, drawn on a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;
- Certified Check No. _____, dated _____, accepted by a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned _____;

WHEREAS:

The Contractor has by written agreement dated _____ entered into a Contract with Obligeo for the following Project:

hereinafter called Contract, which Contract is incorporated herein by reference and made a part hereof.

NOW, THEREFORE,

The condition of this obligation is such that, if Contractor shall promptly and faithfully perform the Contract in accordance with, in all respects, the stipulations, agreements, covenants and conditions of the Contract as it now exists or may be modified according to its terms, free from all liens and claims and without further cost, expense or charge to the Obligeo, its officers, agents, successors, or assigns, free and harmless from all suits or actions of every nature and kind which may be brought for or on account of any injury or damage, direct or indirect, arising or growing out of the doing of said work or the repair or maintenance thereof or the manner of doing the same or the neglect of the Contractor or its agents or servants or the improper performance of the Contract by the Contractor or its agents or servants or from any other cause, and shall promptly pay all persons supplying labor and materials for the performance of the Contract, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

AND IT IS HEREBY STIPULATED AND AGREED that suit on this bond may be brought before a court of competent jurisdiction without a jury, and that the sum or sums specified in the said Contract as liquidated damages, is any, shall be forfeited to the Obligeo, its successor or assigns, in the event of a breach of any, or all, or any part of, the covenants, agreements, conditions, or stipulations contained in the Contract or in this bond in accordance with the terms thereof.

AND IT IS HEREBY STIPULATED AND AGREED that this bond shall inure to the benefit of any and all persons entitled to file claims for labor performed or materials furnished in said work so as to give any and all such persons a right of action as contemplated by Sections 103D-324(d) and 103D-324(e), Hawai'i Revised Statutes.

The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment of mechanics' liens which may be filed of record against the Project, whether or not claim for the amount of such lien be presented under and against this bond.

Signed this _____ day of _____, 20____.

(Seal)

 Name of Contractor

*

 Signature

 Title

*ALL SIGNATURES MUST BE
 ACKNOWLEDGED BY A NOTARY
 PUBLIC

LABOR AND MATERIAL PAYMENT BOND (EXHIBIT E)

EXHIBIT F – PERFORMANCE BOND (SURETY) FOR SUPPLEMENTAL AGREEMENT FOR GOODS AND SERVICES

(11/15/11)

KNOW TO ALL BY THESE PRESENTS:

That

(full legal name and street address of Contractor)
as Contractor, hereinafter called Principal, and

(name and street address of bonding company)
as Surety, hereinafter called Surety, a corporation(s) authorized to transact business as a Surety in the State of Hawai'i, are held and firmly bound unto the Department of Water, County of Maui, its successors and assigns, hereinafter called Oblige, in the amount of _____ Dollars (\$ _____), to which payment Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above-bound Principal has entered into a contract with Oblige, dated _____, for _____, and entered into Supplemental Agreement No. _____, dated _____, for the period hereinafter collectively called Contract, which Contract is incorporated hereby by reference and made a part hereof.

NOW THEREFORE, the condition of the obligation is such that:

If the Principal shall promptly and faithfully perform, and fully complete the Contract in strict accordance with the terms of the Contract as said Contract may be modified or amended from time to time; then this obligation shall be void; otherwise to remain in full force and effect.

Surety to this Bond hereinafter stipulates and agrees that no changes, extensions of time, alterations, or additions to the terms of the Contract, including the work to be performed thereunder, and the specifications or drawings accompanying same, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such changes, extensions of time, alterations or additions, and agrees that they shall become part of the Contract.

In the event of Default by the Principal, of the obligations under the Contract, then after written Notice of Default from the Oblige to the Surety and the Principal, Surety shall either remedy the Default, or take over the work to be performed under the Contract and complete such work, subject, however, to the limitation of the penal sum of this bond.

Signed _____ day of _____, 20____.

(Seal)

Name of Principal (Contractor)

*

Signature

Title

(Seal)

Name of Surety

*

Signature

Title

*ALL SIGNATURES MUST BE
ACKNOWLEDGED BY A NOTARY PUBLIC

PERFORMANCE BOND (SURETY) FOR SUPPLEMENTAL
AGREEMENT FOR GOODS AND SERVICES (EXHIBIT F)

**EXHIBIT G- PERFORMANCE BOND FOR SUPPLEMENTAL AGREEMENT
FOR GOODS AND SERVICES**

(11/15/11)

KNOW TO ALL BY THESE PRESENTS:

That we, _____,

(full legal name and street address of Contractor)

as Contractor, hereinafter called Contractor, is held and firmly bound unto the Department of Water, County of Kaua'i, its successors and assigns, as Obligee, hereinafter called Obligee, in the amount of

_____ (dollar amount of contract)

DOLLARS (\$ _____), lawful money of the United States of America for the payment of which the said Obligee, well and truly to be made, Contractor binds itself, its heirs, executors, administrators, successors and assigns, firmly by these presents. Said amount is evidenced by:

- Legal tender;
- Share Certificate unconditionally assigned to or payable at sight to _____
Description _____
- Certificate of Deposit, No. _____, dated _____
issued by _____
drawn on _____
a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____
- Cashier's Check No. _____, dated _____,
issued by _____
drawn on _____
a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____
- Teller's Check No. _____, dated _____,
issued by _____
drawn on _____
a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;
- Treasurer's Check No. _____, dated _____,
issued by _____
drawn on _____
a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;
- Official Check No. _____, dated _____,
issued by _____ drawn on a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

Not Applicable? Refer to Exhibit J

PERFORMANCE BOND
FOR SUPPLEMENTAL AGREEMENT FOR GOODS AND SERVICES (EXHIBIT G)

Certified Check No. _____, dated _____, accepted by a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned _____;

WHEREAS:

The Contractor has by written agreement dated _____ entered into a Contract with Obligees for the following Project:

_____ and entered into Supplemental Agreement No. _____, dated _____ for the period _____; hereinafter collectively called Contract, which Contract is incorporated herein by reference and made a part hereof.

NOW, THEREFORE,

The condition of this obligation is such that, if Contractor shall promptly and faithfully perform the Contract in accordance with, in all respects, the stipulations, agreements, covenants and conditions of the Contract as it now exists or may be modified according to its terms, and shall deliver the Project to the Obligees, or to its successors or assigns, fully completed as in the Contract specified and free from all liens and claims and without further cost, expense or charge to the Obligees, its officers, agents, successors, or assigns, free and harmless from all suits or actions of every nature and kind which may be brought for or on account of any injury or damage, direct or indirect, arising or growing out of the doing of said work or the repair or maintenance thereof or the manner of doing the same or the neglect of the Contractor or its agents or servants or the improper performance of the Contract by the Contractor or its agents or servants or from any other cause, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

AND IT IS HEREBY STIPULATED AND AGREED that suit on this bond may be brought before a court of competent jurisdiction without a jury, and that the sum or sums specified in the said Contract as liquidated damages, is any, shall be forfeited to the Obligees, its successor or assigns, in the event of a breach of any, or all, or any part of, the covenants, agreements, conditions, or stipulations contained in the Contract or in this bond in accordance with the terms thereof.

The amount of this bond may be reduced by and to the extent of any payment or payments made in good faith hereunder.

Signed and sealed this _____ day of _____, 20_____.

(Seal)

Name of Contractor

*

Signature

Title

*ALL SIGNATURES MUST BE ACKNOWLEDGED BY A NOTARY PUBLIC

PERFORMANCE BOND FOR SUPPLEMENTAL AGREEMENT FOR GOODS AND SERVICES (EXHIBIT G)

EXHIBIT H - CONTRACTOR ACKNOWLEDGMENT

[FOR USE WITH PERFORMANCE AND PAYMENT BONDS]
(11/15/11)

CONTRACTOR ACKNOWLEDGMENT:

STATE OF _____)
) : SS
_____ COUNTY OF _____)

On this _____ day of _____, 20____, before me appeared _____
and _____ to me known to be the person(s) described in and, who, being duly sworn,
did say that he/she/they is/are _____ and _____
of _____ the Contractor named in the foregoing instrument, and that he/she/they
is/are authorized to sign said instrument in behalf of the contractor, and acknowledges that he/she/they executed said
instrument as the free act and deed of the Contractor.

(Notary Seal)
Notary Public

State of _____
My commission expires _____

CONTRACTOR ACKNOWLEDGMENT (EXHIBIT H)

EXHIBIT I - SURETY ACKNOWLEDGMENT

[FOR USE WITH SURETY PERFORMANCE AND PAYMENT BONDS]
(11/15/11)

SURETY ACKNOWLEDGMENT:

STATE OF _____)
) : SS
_____ COUNTY OF _____)

On this _____ day of _____, 20____, before me personally came _____ to me known to be the person described in and who, acting by me, did depose and say that _____ resides in _____; that _____ is the Attorney-in-Fact of _____ the corporation described _____ and which executed the attached instrument; that _____ knows corporate seal of the said corporation that the seal affixed to the said instrument is such corporate seal; and that it was so affixed by order of the Board of Directors of the said corporation; and that _____ signed _____ name thereto by live order.

Notary Public (Notary Seal)
State of _____
My commission expires: _____

Not Applicable; Refer to Exhibit J

EXHIBIT J – SAMPLE CONTRACT

SAMPLE CONTRACT
(05/19/16)



CONTRACT NO. _____

CONSTRUCTION CONTRACT

THIS CONTRACT, effective as of the date of the last signatory, is made and entered into by and between the **Board of Water Supply, County of Kaua'i**, whose mailing address is 4398 Pua Loke Street, Lihu'e, Hawai'i 96766 (hereinafter the "BOARD") and _____, a _____, under the laws of the State of _____, whose principle mailing address is _____ (hereinafter the "CONTRACTOR");

THIS CONTRACT for construction services has been procured under:

- Hawai'i Revised Statute (H.R.S.) §103D-302 (Competitive Sealed Bidding)
- H.R.S. §103D-303 (Competitive Sealed Proposals)
- H.R.S. §103D-305 (Small Purchase)
- H.R.S. §103D-307 (Emergency Procurement # _____)

WITNESSETH:

THAT, for and in consideration of the payment(s) hereinafter set forth to be made by the Board, the Contractor agrees to furnish and pay for all materials, supplies, tools, equipment, labor, utilities, transportation, services, and any and all other incidentals necessary to construct in place and complete, free of all liens, claims, and any encumbrances whatsoever:

(hereinafter "PROJECT").

1. Contract Documents: The Contractor agrees to complete the PROJECT in accordance with this Contract and the following documents:

- Approved construction drawings;
- Specifications;
- Invitation for Bids Document No. _____ and all Addenda thereto;
- Request for Proposals PROJECT No. _____ and all Addenda thereto;

- Bid/Proposal/Best and Final Offer;
- Method of Award;
- Wage Rate Schedule;
- Construction Schedules;
- Special Provisions;
- General Provisions for Construction Contracts of the Department of Water Dated April 25, 2016;

and those other documents attached or referred to therein, relating to the PROJECT (hereinafter collectively referred to as "Contract Documents"). The Contractor understands and agrees that the Contract Documents including, but not limited to, those referenced in but not attached to this Contract and those referenced in but not attached to the Contract Documents, are hereby incorporated by reference into this Contract. The Contractor acknowledges and admits receipt of all Contract Documents, and acknowledges that it has reviewed, understands, and agrees with all terms and conditions in the Contract Documents and those other documents, terms and conditions referenced therein.

2. **Time of Performance:** The Contractor agrees to complete the PROJECT within _____ CALENDAR DAYS, from and including the date as specified in the written Notice to Proceed.
3. **Compensation:** For and in consideration of the Contractor's full and faithful performance of this entire Contract, the Board hereby agrees to pay the Contractor the sum of

DOLLARS (\$_____), federal, state and local taxes included, in lawful money of the United States of America; provided that the Contractor understands and agrees that payment shall be made in the manner and at the times specified in the Contract Documents, and shall also be subject to and conditioned upon such additions to or deductions from the preceding sum as may herein be made, according to the Contract Documents.

4. **Liquidated Damages:** THE CONTRACTOR UNDERSTANDS AND AGREES that time is an essential factor of this Contract; that the Board will suffer material loss by reason of delays that may occur in the Contractor's performance of the work or any portions of the work within the time or times fixed in the Contract or any extensions thereto; and that as liquidated damages for any such delays, the sum of

DOLLARS (\$_____), for each and every calendar day which said performance remains uncompleted will be charged the Contractor and deducted from the Contract price; and it is expressly stipulated by and between the Contractor and Board that any such sums shall be deemed and taken to be liquidated damages for the Contractor's failure to perform within the specified time and not be in the nature of penalty.

5. **Bonds:** The Contractor is required to provide the following bonds, in an amount equal to 100% of the amount of the Contract price in the form(s) set forth in **Exhibit A**:

- Performance Bond (**Exhibit A1**)
- Labor and Material Payment Bond (**Exhibit A2**)
- Not Applicable

6. **Insurance:** Contractor shall procure and maintain, on primary basis and at its sole expense, at all times during the life of the Contract insurance coverages, limit, including endorsements as described in **Exhibit B**, incorporated herein, against claims for injuries to person or damages to property which may arise from or in connection with the performance of the work by the Contractor or the Contractor's agents, representatives, employees or subcontractors. The requirements contained herein, as well as the Board's review or acceptance of insurance maintained by the contractor is not intended to and shall not in any manner limit or qualify the liabilities or obligations assumed by the Contractor.

7. **Officer in Charge:** The Officer in Charge of this PROJECT is:

8. **Severability:** In the event any term or provision of this Contract is declared to be invalid or illegal for any reason, this Contract will remain in full force and effect and will be interpreted as though such invalid or illegal provision were not a part of this Contract.

9. **Execution in Counterparts:** This Contract may be executed in counterparts, all of which shall be considered the same as if a single document shall have been executed, but shall become effective when such counterparts have been signed by each of the parties hereto and delivered to each party. Further, facsimile signatures and notarizations are permissible provided original signatures and notarizations bearing the notary's seal are later provided to the party in receipt of the facsimile signature and notarizations.

10. **Waiver:** Waiver of a breach or default under this Agreement shall not constitute a continuing waiver or a waiver of a subsequent breach of the same or any other provision of this Agreement.

THE PARTIES FURTHER AGREE that:

- Concurrently with its execution of this Contract, Contractor shall submit to the Officer-in-Charge:
 - a tax clearance pursuant to Haw. Rev. Stat., as amended (hereinafter "H.R.S." §103-53;
 - a Certificate of Compliance pursuant to Hawai'i Administrative Rules (hereinafter "H.A.R.") §3-122-112; and

- a Certificate of Good Standing pursuant to H.A.R. §3-122-112.

Further, as a condition of final payment on this Contract, Contactor shall submit to the Officer-in-Charge:

- a tax clearance to pursuant to H.R.S. §103-53; and
- a Certificate of Compliance pursuant to H.A.R. §3-122-112.

All clearances and certificates submitted pursuant to the foregoing statutory requirements shall be valid when the Contract is executed by all parties hereto and when final payment is made.

As used in this Contract, “Board” means the Board of Water Supply of the County of Kaua‘i and the Department of Water, County of Kaua‘i, and its officers, agents, and employees.

IN WITNESS WHEREOF, the parties hereto have hereunto caused this instrument to be executed as of the _____ day of _____, _____.

APPROVED:

BOARD OF WATER SUPPLY
COUNTY OF KAUA‘I

By _____

APPROVED AS TO FORM
AND LEGALITY:

CONTRACTOR

By _____
Its _____

By _____
Its _____

STATE OF HAWAI'I)
) ss.
COUNTY OF KAUA'I)

On this _____ day of _____, _____, before me appeared _____ to me personally known, who being by me was duly sworn, and that said officer is the Chairperson of the BOARD OF WATER SUPPLY, COUNTY OF KAUA'I, and that the foregoing instrument was signed on behalf of said Board with authority of said Board, and that said officer acknowledged the instrument to be the free act and deed of said Board, and that said Board has no corporate seal.

Notary Public, State of Hawai'i

Name of Notary: _____

My commission expires: _____

Doc. Date: _____ # Pages: _____

Name of Notary: _____ Fifth Circuit

Doc. Description: _____

Notary Signature

Date

STATE OF HAWAI'I)
) ss.
COUNTY OF _____)

On this _____ day of _____, _____, before me appeared _____ to me personally known, who being by me was duly sworn, did say he/she is the _____ of _____, a _____ and that said instrument was signed and sealed on behalf of said _____; and said officer acknowledged said instrument to be the free act and deed of said _____.

Notary Public, State of Hawai'i

Name of Notary: _____

My commission expires: _____

(PLEASE INSERT YOUR APPLICABLE NOTARY SECTION)

EXHIBIT A1
PERFORMANCE BOND (SURETY)

KNOW ALL MEN BY THESE PRESENTS:

That _____,

a _____ corporation, whose principle mailing address is

_____,

as Principal, (hereinafter referred to as "Principal"), and _____,

as Surety, (hereinafter referred to as "Surety"), a corporation(s) authorized to transact business as a surety in the State of Hawai'i, are held and firmly bound unto the Board of Water Supply, its successors and assigns, (hereinafter referred to as "Obligee"), in the amount of

DOLLARS (\$ _____) to which payment Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above-bound Principal has entered into a Contract with Obligee dated _____ for _____ (hereinafter referred to as the "Contract"), which Contract is incorporated herein by reference and made a part hereof.

NOW THEREFORE, the condition of this obligation is such that:

If the Principal shall promptly and faithfully perform, and fully complete the Contract in strict accordance with the terms of the Contract as said Contract may be modified or amended from time to time; then this obligation shall be void; otherwise to remain in full force and effect.

Surety to this bond hereby stipulated and agrees that no changes, extensions of time, alterations, or additions to the terms of the Contract, including the work to be performed thereunder, and the specifications or drawings accompanying same, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such changes, extensions of time, alterations, or additions, and agrees that they shall become part of the Contract.

In the event of Default by the Principal, of the obligations under the Contract, then after written Notice of Default from the Obligee to the Surety and the Principal, Surety shall either remedy the Default, or take over the work to be performed under the contract and complete such work, subject, however, to the limitation of the penal sum of this bond.

Signed and sealed this _____ day of _____, _____.

Principal Seal

By _____

Its By _____

Its _____

Surety Seal

By _____

Its By _____

Its _____

ALL SIGNATURES MUST BE ACKNOWLEDGED BY A NOTARY PUBLIC

SURETY PERFORMANCE BOND

STATE OF HAWAI'I)
) ss.
COUNTY OF _____)

On this _____ day of _____, _____, before me appeared _____ to me personally known, who being by me was duly sworn, did say he/she is the _____ of _____, a _____; that the seal affixed to the foregoing instrument is the _____ seal of said _____; and said officer acknowledged said instrument to be the free act and deed of said _____.

Notary Public, State of Hawai'i

Name of Notary: _____

My commission expires: _____

(SURETY PLEASE INSERT YOUR APPLICABLE NOTARY SECTION.)

**EXHIBIT A1
PERFORMANCE BOND**

KNOW TO ALL BY THESE PRESENTS:

That we, _____, as Contractor, hereinafter called Contractor, is held and firmly bound unto the _____, its successors and assigns, as Obligee, hereinafter called Obligee, in the amount of

_____ **DOLLARS** (\$_____), lawful money of the United States of America, for the payment of which to the said Obligee, well and truly to be made, Contractor binds itself, its heirs, executors, administrators, successors and assigns, firmly by these presents. Said amount is evidenced by:

- Legal tender;
- Share Certificate unconditionally assigned to or made payable at sight to

Description _____;
- Certificate of Deposit, No. _____, dated _____,

issued by _____,
drawn on _____,
a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or
the Nation Credit Union Administration, payable at sight or unconditionally assigned to _____;
- Cashier's Check No. _____, dated _____,

issued by _____,
drawn on _____,
a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or
the National Credit Union Administration, payable at sight or unconditionally assigned to _____;
- Teller's Check No. _____, dated _____,

issued by _____,
drawn on _____,

a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to

_____;

Treasurer's Check No. _____, dated _____,

issued by _____,

drawn on _____,

a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to

_____;

Official Check No. _____, dated _____,

issued by _____,

drawn on _____,

a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to

_____;

Certified Check No. _____, dated _____,

accepted by a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned _____;

WHEREAS:

The Contractor has by written agreement dated _____ entered into a contract with Oblige
for the following PROJECT:

hereinafter called Contract, which Contract is incorporated herein by reference and made a part hereof.

NOW, THEREFORE,

The condition of this obligation is such that, if Contractor shall promptly and faithfully perform the Contract in accordance with, in all respects, the stipulations, agreements, covenants and conditions of the Contract as it now exists or may be modified according to its terms, and shall deliver the PROJECT to the Oblige, or to its successors or assigns, fully completed as in the Contract specified and free from all liens and claims and without further cost, expense or charge to the Oblige, its officers, agents, successors or assigns, free and harmless from all suits or actions of every

nature and kind which may be brought for or on account of any injury or damage, direct or indirect, arising or growing out of the doing of said work or the repair or maintenance thereof or the manner of doing the same or the neglect of the Contractor or its agents or servants or the improper performance of the Contract by the Contractor or its agents or servants or from any other cause, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

AND IT IS HEREBY STIPULATED AND AGREED that suit on this bond may be brought before a court of competent jurisdiction without a jury, and that the sum or sums specified in the said Contract as liquidated damages, if any, shall be forfeited to the Obligee, its successors or assigns, in the event of a breach of any, or all, or any part of, the covenants, agreements, conditions, or stipulations contained in the Contract or in this bond in accordance with the terms thereof.

The amount of this bond may be reduced by and to the extent of any payment or payments made in good faith hereunder.

Signed this _____ day of _____, _____.

(Seal) _____
Name of Contractor
* _____
Signature

Title

STATE OF HAWAI'I)
) ss.
COUNTY OF _____)

On this _____ day of _____, _____, before me appeared _____ to me personally known, who being by me was duly sworn, did say he/she is the _____ of _____, a _____; that the seal affixed to the foregoing instrument is the _____ seal of said _____; and said officer acknowledged said instrument to be the free act and deed of said _____.

Notary Public, State of Hawai'i
Name of Notary: _____
My commission expires: _____

ALL SIGNATURES MUST BE ACKNOWLEDGED BY A NOTARY PUBLIC.

EXHIBIT A2
LABOR AND MATERIAL PAYMENT BOND (SURETY)

KNOW ALL MEN BY THESE PRESENTS:

That _____, a _____
corporation, whose principle mailing address is _____,
as Principal (hereinafter referred to as "Principal"), and _____,
as Surety (hereinafter referred to as "Surety"), a corporation(s) authorized to transact business as a surety in the State of
Hawai'i, are held and firmly bound unto the Board of Water Supply, its successors and assigns (hereinafter referred to
as "Obligee"), in the amount of

DOLLARS (\$ _____), to which payment Principal and Surety bind themselves, their heirs, executors,
administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above-bound Principal has entered into a Contract with Obligee dated _____
for _____ (hereinafter referred to as the "Contract"), which
Contract is incorporated herein by reference and made a part hereof.

NOW, THEREFORE, the condition of this obligation is such that if the Principal shall promptly make
payment to any Claimant, as hereinafter defined, for all labor and materials supplied to the Principal for use in the
performance of the Contract, then this obligation shall be void; otherwise to remain in full force and effect.

1. Surety to this Bond hereby stipulates and agrees that no changes, extensions of time, alterations, or
additions to the terms of the Contract, including the work to be performed thereunder, and the
specifications or drawings accompanying same, shall in any way affect its obligation on this bond,
and it does hereby waive notice of any such changes, extensions of time, alterations, or additions,
and agrees that they shall become part of the Contract.
2. A "Claimant" shall be defined herein as any person who has furnished labor or materials to the
Principal for the work provided in the Contract.

As provided in Section 103D-324, Hawai'i Revised Statutes, every Claimant who has not been paid in full
before the expiration of a period of ninety days after the day on which the last of the labor was done or performed or
material was furnished or supplied, for which such a claims made, may institute an action against the Principal or the
Principal and its Surety, on this bond and have their rights and claims adjudicated in the action, and judgment rendered
thereon; subject to the Obligee's priority on the bond. If the full amount of the liability of the Surety on the bond is

insufficient to pay the full amount of the claims, then after paying the full amount due the Oblige, the remainder shall be distributed pro rata among the claimants.

Signed and sealed this _____ day of _____, _____.

Principal Seal

By _____

Its By _____

Its _____

Surety Seal

By _____

Its By _____

Its _____

ALL SIGNATURES MUST BE ACKNOWLEDGED BY A NOTARY PUBLIC.

SURETY LABOR AND MATERIAL
PAYMENT BOND

STATE OF HAWAI'I)
) ss.
COUNTY OF _____)

On this _____ day of _____, _____, before me appeared
_____ to me personally known, who being by me was duly sworn, did say he/she is the _
_____ of _____, a _____; that the seal affixed to the
foregoing instrument is the _____ seal of said _____; and said officer acknowledged said
instrument to be the free act and deed of said _____.

Notary Public, State of Hawai'i

Name of Notary: _____

My commission expires: _____

(SURETY PLEASE INSERT YOUR APPLICABLE NOTARY SECTION)

EXHIBIT A2
LABOR AND MATERIAL PAYMENT BOND
(11/17/98)

KNOW TO ALL BY THESE PRESENTS:

That we, _____, as Contractor, hereinafter called Contractor, is held and firmly bound unto the _____, its successors and assigns, as Obligee, hereinafter called Obligee, in the amount of

DOLLARS (\$ _____), lawful money of the United States of America, for the payment of which to the said Obligee, well and truly to be made, Contractor binds itself, its heirs, executors, administrators, successors and assigns, firmly by these presents. Said amount is evidenced by:

Legal tender;

Share Certificate unconditionally assigned to or made payable at sight to

Description

_____;

Certificate of Deposit, No. _____, dated _____,
issued by _____,
drawn on _____,

a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to

_____;

Cashier's Check No. _____, dated _____,
issued by _____,
drawn on _____,

a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to

_____;

Teller's Check No. _____, dated _____,
issued by _____,
drawn on _____,

a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to

Treasurer's Check No. _____, dated _____,
issued by _____,
drawn on _____;

a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to

Official Check No. _____, dated _____,
issued by _____,
drawn on _____;

a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to

Certified Check No. _____, dated _____,
accepted by a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned _____;

WHEREAS:

The Contractor has by written agreement dated _____ entered into a contract with Obligee for the following PROJECT:

hereinafter called Contract, which Contract is incorporated herein by reference and made a part hereof.

NOW, THEREFORE,

The condition of this obligation is such that, if Contractor shall promptly and faithfully perform the Contract in accordance with, in all respects, the stipulations, agreements, covenants and conditions of the Contract as it now exists or may be modified according to its terms, free from all liens and claims and without further cost, expense or charge to the Obligee, its officers, agents, successors or assigns, free and harmless from all suits or actions of every nature and kind which may be brought for or on account of any injury or damage, direct or indirect, arising or growing

out of the doing of said work or the repair or maintenance thereof or the manner of doing the same or the neglect of the Contractor or its agents or servants or the improper performance of the Contract by the Contractor or its agents or servants or from any other cause, and shall promptly pay all persons supplying labor and materials for the performance of the Contract, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

AND IT IS HEREBY STIPULATED AND AGREED that suit on this bond may be brought before a court of competent jurisdiction without a jury, and that the sum or sums specified in the said Contract as liquidated damages, if any, shall be forfeited to the Obligee, its successors or assigns, in the event of a breach of any, or all, or any part of, the covenants, agreements, conditions, or stipulations contained in the Contract or in this bond in accordance with the terms thereof.

AND IT IS HEREBY STIPULATED AND AGREED that this bond shall inure to the benefit of any and all persons entitled to file claims for labor performed or materials furnished in said work so as to give any and all such persons a right of action as contemplated by Sections 103D-324(d) and 103D-324(e), Hawai'i Revised Statutes.

The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment of mechanics' liens which may be filed of record against the PROJECT, whether or not claim for the amount of such lien be presented under and against this bond.

Signed this _____ day of _____, _____.

(Seal) _____
Name of Contractor

* _____
Signature

Title

STATE OF HAWAI'I)
) ss.
COUNTY OF _____)

On this _____ day of _____, _____, before me appeared _____ to me personally known, who being by me was duly sworn, did say he/she is the _____ of _____, a _____; that the seal affixed to the foregoing instrument is the _____ seal of said _____; and said officer acknowledged said instrument to be the free act and deed of said _____.

Notary Public, State of Hawai'i
Name of Notary: _____
My commission expires: _____

(ALL SIGNATURES MUST BE ACKNOWLEDGED BY A NOTARY PUBLIC)

EXHIBIT B
INSURANCE REQUIREMENTS
BOARD OF WATER SUPPLY COUNTY OF KAUA'I

Contractor shall procure and maintain, on primary basis and at its sole expense, at all times during the life of the contract insurance coverages, limits, including endorsements described herein against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work by the Contractor or the Contractor's agents, representatives, employees or subcontractors. The requirements contained herein, as well as the Department of Water, County of Kaua'i's (hereinafter "DOW") review or acceptance of insurance maintained by the Contractor is not intended to and shall not in any manner limit or qualify the liabilities or obligations assumed by the Contractor.

To the extent applicable, the amounts and types of insurance will conform to the minimum terms, conditions and coverage(s) of Insurance Service Office (ISO) policies, forms, and endorsements.

A. General Conditions

Waiver of Subrogation. Contractor shall agree by entering into a contract with the Board of Water Supply, County of Kaua'i (hereinafter "Board") to provide a Waiver of Subrogation for the Commercial General Liability, Automobile Liability, and Workers Compensation policies. When required by the insurer, or should a policy condition not permit Contractor to enter into a pre-loss agreement to waive subrogation without an endorsement, the Contractor shall agree to notify the insurer and request the policy be endorsed with a Waiver of Subrogation in favor of the Board. This Waiver of Subrogation requirement shall not apply to any policy, which includes a condition specifically prohibiting such an endorsement, or voids coverage should Contractor enter into such an agreement on a pre-loss basis.

Subcontractors. If applicable, Contractor shall include all subcontractors as additional insureds under its policies and shall retain the records of the separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to the same requirements as the Contractor as stated herein.

APPLICABLE

NOT APPLICABLE

Additional Insured. Contractor shall agree to endorse the **BOARD OF WATER SUPPLY, COUNTY OF KAUA'I as an Additional Insured** with a CG026 Additional Insured – Designated Person or Organization endorsement, a copy of the applicable policy language, or similar endorsement to all required insurance policy(ies), except for Workers Compensation and Professional Liability.

Deductibles and Self-Insured Retentions. Any deductibles or self-insured retentions must be declared to and approved by the DOW. At the option of the DOW, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Board; or the Contractor shall provide a financial guarantee (audited financial statement) satisfactory to the Department guaranteeing payment of losses and related investigations, claim administration and defense expenses.

When a self-insured retention (SIR) or deductible exceeds \$50,000, the Department reserves the right, but not the obligation, to review and request a copy of the Contractor's most recent annual report or audited financial statement.

Contractor's Responsibility. The Contractor is responsible for paying any portion of any loss not covered because of the operation of any deductible, co-insurance clause or self-insured retention applicable to the insurance required herein. If the Board is damaged by the failure of the Contractor to maintain insurance as required in this paragraph, then the Contractor shall bear all reasonable costs properly attributable to that failure.

Primary and Non-contributory. All policies required of the Contractor will be endorsed as primary and any insurance or self-insurance program maintained by the Board shall be non-contributory.

Certificate of Insurance. Concurrent with the execution of the contract, Contractor shall provide the Department a certificate of insurance completed by a duly authorized representative of their insurer certifying that the liability coverage(s) is written on an occurrence form. Immediately upon becoming aware that its insurance will be cancelled, non-renewed, or materially changed, Contractor will notify Department by providing written notice.

The Certificate Holder address shall read:

**Board of Water Supply, County of Kaua'i
4398 Pua Loke Street, Lihue, HI 96766**

Attention: (_____ **Name of Contact Person**)

Contract No. _____

Project Title _____

Concurrent with the execution the contract the Contractor shall furnish the Department with original certificates and endorsements effecting required coverage(s). The Department reserves the right to require complete copies of all required insurance policies, including the policy declarations and endorsements affecting the coverage at any time.

Failure to secure and maintain the required insurance shall be considered as a material breach of the contract. Should the Board be forced to expend funds that would have been covered under the specified insurance, Contractor shall reimburse the Board for such funds. In the event the Board determines, in its sole and absolute discretion, that it is necessary to purchase the coverages herein required of the Contractor, and which the Contractor has failed to secure, the Contractor shall reimburse the Board for the expenditure of such funds.

Right to Revise or Reject. Department reserves the right, but not the obligation, to review and revise any insurance requirement, not limited to limits, coverages and endorsements based on insurance market conditions affecting the availability or affordability of coverage; or changes in the scope of work or specifications affecting the applicability of coverage. Additionally, the Department reserves the right, but not the obligation, to review and reject any insurance policies failing to meet the criteria stated herein or any insurer providing coverage due to its poor financial condition or failure to operate legally.

B. Minimum Insurance Coverage Requirements

Unless otherwise approved by the Manager and Chief Engineer, the policy or policies of insurance maintained by the Contractor shall provide the following minimum limit(s) and coverage(s) as specified herein and be placed with an insurance carrier authorized to do business in the State of Hawaii and rated A-VII by A.M. Best:

Commercial General Liability. The Contractor shall procure and maintain Commercial General Liability, with dedicated required limits, as set forth herein, written on occurrence form providing:

Designated premises basis

OR

Per Project basis

The coverages shall include the following:

- Premises Operations
- Independent Contractors
- Products and Completed Operations
- Broad Form Property Damage including completed operations
- Blanket Contractual Liability
- Personal Injury
- Employees named as Additional Insured
- Severability of Interest
- Explosion, Collapse and Underground Property Damage

The minimum limits of liability may be satisfied by providing either:

Bodily Injury and Property Damage Combined Single Limit: <input type="checkbox"/> \$2,000,000 per occurrence <input type="checkbox"/> \$2,000,000 annual aggregate	OR	Personal Injury: <ul style="list-style-type: none"> ▪ \$1,000,000 per occurrence ▪ \$2,000,000 annual aggregate AND Products and Completed Operations: <ul style="list-style-type: none"> ▪ \$1,000,000 per occurrence ▪ \$2,000,000 annual aggregate
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Contractor must provide evidence the Board is an Additional Insured for Products/Completed Operations coverage for both ongoing operations and after substantial completion of the work. This coverage may be provided by the ISO form CG 2010 (11 85) or an equivalent policy form. Coverage provided by a non-equivalent CGL form shall be specifically endorsed providing both the course of construction and products/completed operations. ISO CG 2010 (04 13) and ISO form CG 2037 (04 13) or an equivalent form is required from the Contractor. The Contractor and subcontractor(s), if any, shall provide evidence to the Department on an annual basis the products/completed operation coverage is in effect for two (2) years after substantial completion of the project.

- Business Automobile Liability.** The Contractor shall procure and maintain Business Automobile Liability written on occurrence form for all Owned, Non-owned, and Hired automobiles. If the Contractor does not own automobiles, Contractor shall agree to maintain coverage for Hired & Non-Owned Auto Liability, which may be satisfied by way of endorsement to the Commercial General Liability policy or separate Business Automobile Liability. Coverage shall be for automobile contractual liability, uninsured and underinsured motorist coverage, basic no-fault, and personal injury protection, as required by Hawai'i law with the following limits:

Bodily Injury
\$1,000,000 per person
\$1,000,000 per occurrence
Property Damage
\$1,000,000 per accident

- Workers' Compensation and Employer's Liability.** The Contractor shall procure and maintain at all times during the term of the contract the following insurance liability coverage: Workers' Compensation, Temporary Disability Insurance (TDI), and similar insurance that is required by the State of Hawai'i or federal laws. Self-insurance is permitted subject to submission of a copy of the appropriate governmental authorization and qualification by the Contractor and subcontractor(s).
The minimum limits of liability to be maintained are as follows:

Coverage A: State of Hawai'i Workers' Compensation Law:
Statutory Limits.

Coverage B: Employer's Liability:
Bodily Injury from each accident \$1,000,000
Bodily Injury from disease \$1,000,000
Bodily Injury from disease aggregate \$1,000,000

- Builder's Risk.** The Contractor shall procure and maintain an Inland Marine Builder's Risk policy providing coverage to protect the interests of the Board, Contractor, sub-contractors, architects, and engineers, including property in transit and property on or off- premises, which shall become part of the building, or Project. Coverage shall be written on an **All Risk, Replacement Cost, and Completed Value Form** basis in an amount at least equal to 100% of the projected completed value of the Project as well as subsequent modifications of that sum, unless an agreed amount is otherwise stated between the Department and the Contractor. The policy shall insure all work, labor, and materials furnished by the Contractor and the Contractor's subcontractors against loss occasioned by fire, lightning, windstorm, theft, vandalism, malicious mischief, flood, earthquake, and collapse.

The amount of coverage for the perils of flood and earthquake may be subject to a sub-limit. The sub-limit shall provide coverage of at least 25% of the full replacement cost.

The policy shall also include coverage for debris removal and reasonable compensation for architect's and engineer's services and expenses required as a result of an insured loss. The Contractor shall endorse the policy with a manuscript endorsement eliminating the automatic termination of coverage in the event the building is occupied in whole or in part, or put to its intended use, or partially accepted by the Department. The manuscript endorsement shall amend the automatic termination clause to only terminate coverage if the policy expires, is cancelled, the Board's interest in the building ceases, or the building is accepted or insured by the Board.

The Contractor shall name the Board of Water Supply, County of Kaua'i as a loss payee on the Builder's Risk policy.

Installation Floater. The Contractor shall procure and maintain an Installation Floater policy providing coverage to protect the interests of the Board, Contractor, sub-contractor(s), architects, and engineers, including property in transit and property on or off-premises, which shall become part of the project.

Coverage shall be written on an All Risk, Replacement Cost, and Completed Value Form basis in an amount at least equal to 100% of the projected completed value of the Project as well as subsequent modifications of that sum, unless an agreed amount is otherwise stated between the Department and the Contractor. The policy shall insure all work, labor, and materials furnished by the Contractor and the Contractor's subcontractors against loss occasioned by fire, lighting, windstorm, theft, vandalism, malicious mischief, flood, earthquake, and collapse.

The amount of coverage for the perils of flood and earthquake may be subject to a sub-limit. The sub-limit shall provide coverage of at least 25% of the full replacement cost.

The policy shall also include coverage for debris removal and reasonable compensation for architect's and engineer's services and expenses required as a result of an insured loss. The Contractor shall endorse the policy with a manuscript endorsement eliminating the automatic termination of coverage in the event the building is occupied in whole or in part, or put to its intended use, or partially accepted by the Department. The manuscript endorsement shall amend the automatic termination clause to only terminate coverage if the policy expires, is cancelled, the Board's interest in the building ceases, or the building is accepted or insured by the Board.

The Contractor shall name the Board of Water Supply, County of Kaua'i as a loss payee on the Installation Floater policy.

Professional Liability (Errors and Omissions). The Contractor and its subcontractors shall procure and maintain Professional Liability Insurance (Errors and Omissions Insurance) that covers all such activities under the contract. Such insurance shall have these minimum limits and coverage(s):

\$1,000,000 per occurrence
\$2,000,000 annual aggregate

For policies written on a "Claims-Made" basis, Contractor warrants the retroactive date equals or precedes the effective date of the contract. In the event the policy is canceled, non-renewed, switched to an Occurrence Form, retroactive date advanced; or any other event triggering the right to purchase a Supplemental Extended Reporting Period (SERP) during the life of the contract, Contractor shall agree to purchase Supplemental Extended Reporting Period (SERP) with a minimum reporting period not less than **two (2)** years.

The requirement to purchase a SERP shall not relieve Contractor of the obligation to provide replacement coverage.

Pollution Legal Liability. The Contractor shall procure and maintain Pollution Liability or similar Environmental Impairment Liability at a minimum limit not less than:

\$1,000,000 per occurrence
\$2,000,000 annual aggregate

The policy shall provide coverage for damages against, but not limited to, third-party liability, clean-up, corrective action including assessment, remediation and defense costs.

Contractor's Pollution Liability. Contractor shall procure and maintain pollution liability insurance when the Scope of Work involves removal, abatement, encapsulation or other treatment, disposal or remediation of asbestos or other hazardous materials or an exposure to pollutants or impairment of the environment. The policy shall provide coverage for third party liability, clean-up, and corrective action including assessment remediation and defense costs. The policy may be written on either an occurrence form or claims made. The minimum limits of liability shall be:

\$1,000,000 per occurrence
\$2,000,000 annual aggregate

Crime Insurance or Commercial Fidelity Bond: Contractor shall procure and maintain Commercial Crime Insurance or Fidelity Bond providing Employee Dishonesty on a blanket basis covering all of the Contractor's employees with a minimum amount of insurance at least equal to the amount of the contract. The policy shall be endorsed to cover "Third-Party Liability" including a third-party beneficiary clause in favor of the Board. The policy shall include a minimum twelve (12) month "Discovery Period" when written on a Loss Sustained basis.

Property. The Tenant or Lessee, shall agree to maintain property insurance including flood and windstorm written on a replacement cost basis in an amount not less than 100% of the replacement cost of the building(s) and contents, including betterments and improvements made by the Tenant or Lessee, located on the premises. Contractor shall agree to be fully responsible for any deductible or self-insured retention, and to provide this coverage on primary basis.

Umbrella or Excess Liability. Contractor may satisfy the minimum liability limits required above under an Umbrella or Excess Liability policy with \$1,000,000 per occurrence and \$2,000,000 aggregate. If Contractor is using its Umbrella or Excess Liability Insurance policy to satisfy the minimum requirements, Contractor shall agree to endorse the Board of Water Supply, County of Kaua'i as "Additional Insured" on the Umbrella or Excess Liability policy, or shall confirm in writing that its Umbrella or Excess Liability policy "follows form."

CONTRACT (EXHIBIT J)

EXHIBIT K - CONTRACT CHANGE ORDER

CONTRACT CHANGE ORDER DEPARTMENT OF WATER COUNTY OF KAUAI

Project						Order No.	
						Date	
Project No.			Change Requested By:			Contract No.	
To _____, Contractor:							
Estimate of Quantities and Costs:							
Item No.	Item	Quantity	Unit	Contract Unit Price	Agreed Unit Price	\$ Amount (+ or -)	
CONTRACT PRICE			CONTRACT CERTIFICATION			CONTRACT TIME	
<input type="checkbox"/> No Change <input type="checkbox"/> Increased by \$ _____ <input type="checkbox"/> Decreased by \$ _____			Amount Certified \$ _____ New Contract Price \$ _____			<input type="checkbox"/> No Change <input type="checkbox"/> Increased by _____ Calendar days <input type="checkbox"/> Decreased by _____ Calendar days	
Submitted by:			Approved:			Accepted:	
Project Engineer Date			Fiscal Officer Date				
ED&C Division Head Date			Mgr & Chief Engineer Date				
<p>This Change Order No. ___ is issued pursuant to the Contract and, upon execution, shall become incorporated in the Contract. The amount set forth in this Change Order comprises the total compensation due the Contractor, all Subcontractors, and all Suppliers, for any work performed under this Change Order, including impact on unchanged work. The signing of this Change Order indicates that the Change Order constitutes full mutual accord and satisfaction for the contract including any change and that the charge under this Change Order constitutes the total equitable adjustment owed the Contractor, all Subcontractors, and all Suppliers under this contract. Any future dispute regarding time required for performance or contract price as related to this Change Order is subject to the terms of the General Provisions for Construction Contracts of the Department of Water, County of Kaua'i as amended and Hawai'i Revised Statutes and Hawai'i Administrative Rules.</p>							
Accepted:							
Contractor		Title				Date	

CONTRACT CHANGE ORDER (EXHIBIT K)

EXHIBIT L – CONTRACT MODIFICATION FORM

CONTRACT MODIFICATION FORM (11/15/11)

DEPARTMENT OF WATER
COUNTY OF KAUAI
STATE OF HAWAII

MODIFICATION ORDER NO. _____ Date _____

Contractor _____ Contract No. _____

Contract Title _____

A. MODIFICATIONS

The following modifications are to be performed in accordance with all contract stipulations (specifications, delivery point, rate of delivery, period of performance, price, quantity, or other provisions by mutual action of the parties to the contract.)

B. CONTRACTOR'S QUOTATION

The modifications described in "A" above will be performed at a contract price ____ increase ____ decrease of \$ _____. Contractor will not undertake to perform the changes in "A" above until this modification order has been approved and issued.

Contractor's Signature and Date

C. STATEMENT OF CONTRACT FUNDS

Original Contract Price \$ _____

Previous Adjusted Contract Price \$ _____

Amount this Change: Plus ____ Minus _____

New Adjusted Contract Price \$ _____

D. VALIDATION OF CONTRACT MODIFICATION

Dept. of Water Date

Manager & Chief Engineer Date

DISTRIBUTION: Original - Contracting Office c: Contractor

CONTRACT MODIFICATION FORM (EXHIBIT L)

EXHIBIT M – AS BUILT INFORMATION REQUIRED
AS-BUILT INFORMATION REQUIRED

A. As-built information for Waterlines

1. Note any changes in alignment and grade.
 - a. Reference alignment change to baseline or original waterline alignment.
2. Note the cover and existing waterlines (when exposed) and at connection areas.
3. Note the brand and model no. of the following:
 - a. Fire Hydrants
 - b. Valves
 - c. A.C. pipe
 - d. D.I. pipe
 - e. Backflow Preventers (also note down the serial number)
4. Count the number of turns required to open each valve.
 - a. Note this down in the as-builts and write in the date that this was checked.
5. Reference the location of all valves.
 - a. Use the best available reference points.
 - b. If a power pole is used, note down the pole number.
 - c. Use at least two (2) reference points per valve
 - d. Examples of reference points.
 - i. Fire hydrant
 - ii. Water meter box
 - iii. ARV box
 - iv. Cleanout box
 - v. Power pole
 - vi. Street light base
 - vii. Guy wire anchor
 - viii. Street Monument
 - ix. Corner of catch basin
 - x. Drainage structures
 - xi. Manhole Cover
 - xii. Street Signs
 - xiii. Bridge abutments
 - xiv. Corner of a building
 - xv. Any reasonably permanent object
6. Reference hydrant valves to at least two (2) other reference points in addition to the distance from the hydrant head.
 - a. If the hydrant gets knocked down by a vehicle and doesn't get replaced until later, and in the meantime, if the State or County repaves the roadway and the roadway and the hydrant bury gets overgrown with vegetation, Operations can locate the hydrant valve by measuring from the reference points.

AS-BUILT INFORMATION REQUIRED (EXHIBIT M)

B. As-built information for Service Laterals

1. When a new service lateral is installed away from the property corners, measure the distance from the nearest property corner to the meter box.
2. When the existing service laterals are not located at the property corners, measure the distance from the nearest property corner to the existing meter boxes.
 - a. Write down the meter numbers for the existing meter(s).
3. Measure the distance from the angle valve to the waterline at cul-de-sacs and along curves
4. Detector Checks and Compound Meter Laterals
 - a. Verify that the meter spool cannot flow water through the lateral.

C. As-built Drawing Information for Pumping Stations

1. Depth to bottom of well
 - a. Usually measured with a bailer
2. Depth of static water level
 - a. Use well sounder
3. Length and diameter of discharge columns installed
4. Length of pump bowls
5. Length of strainer
6. Location of the bottom of the airline
 - a. Usually placed at the top of the pump coupling
 - b. The bottom of the airline should be beveled at a 45-degree angle
7. Pump data
 - a. Brand, serial number, model number, number of stages.
8. Take meggar readings when installing submersible pumps
9. Motor data
 - a. Write down the nameplate data and space heater serial number on the as-built plans
10. Record the nameplate data for:
 - a. Booster pumps
 - b. Chlorinator booster pumps
 - c. Air compressors

D. As-built Information for Water Tanks

1. Reference the location of the splices along the water stop.

EXHIBIT N – BMP INSPECTION FORM

Department of Water
County of Kauai
Lihue, Kauai, Hawaii

Site Specific Construction Best Management Practices Inspection Form

Job No.: _____ Water Plan 2020 No.: _____ NGPC File No.: _____

Project Title: _____

Date: _____ / _____ / _____ Weather: _____

DOW Inspector: _____

Duly Authorized Representative: _____ Contractor: _____

Site Specific Construction Best Management Practices (SSCBMPs) Plan	Yes	No	N/A	Date Corrected	Notes*
Is a copy of the SSCBMP plan available at the site?					
Is the SSCBMP plan certified, signed and dated?					
Is the SSCBMP pan current and up-to-date?					
Are accompanying erosion and sediment control (ESC) drawings available at the site?					
Are the ESC drawings up-to-date?					
Are all NGPCs available at the site?					
Are inspection records available at the site?					

Best Management Practices	Location	Installed per Specification (Y/N)	Adequate	Needs maintenance	N/A	Date Corrected	Notes*
Storm Water Run On (SSCBMP Section 3.1)							
Vegetated Diversion Ditches							
Soil Stabilization (SSCBMP Section 3.2)							
n/a							

Best Management Practices	Location	Installed per Specification (Y/N)	Adequate	Needs maintenance	N/A	Date Corrected	Notes*
Slope Protection (SSCBMP Section 3.3)							
Erosion Control Mats							
Storm Drain Inlet Protection (SSCBMP Section 3.4)							
Mulch socks at all active inlets							
Perimeter Controls and Sediment Barriers (SSCBMP Section 3.5)							
Silt Fence							
Mulch socks							
Sediment Basins and Detention Ponds (SSCBMP Section 3.6)							
Sed Basin							
Stabilized Ingress/Egress (SSCBMP Section 3.7)							
Stabilized egress							
Signage for entrance only							
Signage for exit only							
Additional Erosion and Sediment Control BMPs (SSCBMP Section 3.8)							
Mirafi over soil stockpile							
Material Handling and Waste Management (SSCBMP Section 3.9)							

Bins for Trash							
Baseyards/Staging Areas (SSCBMP Section 3.10)							
Store paint/resin/plaster in container							
Silt Fence							
Wash out Areas (SSCBMP Section 3.11)							
Concrete Washout Container							
Concrete Washout Container							
Proper Equipment/Vehicle Fueling and Maintenance Practices (SSCBMP Section 3.12)							
Lined pit under diesel tank							
Spill kit next to diesel tank							
Additional Non-Erosion or Sediment Control BMPs (SSCBMP Section 3.13)							

Best Management Practices	Location	Installed per Specification (Y/N)	Adequate	Needs maintenance	N/A	Date Corrected	Notes*
Post Construction BMPs (SSCBMP Section 3.14)							
Other							

* Attached additional sheet for notes if necessary

Site Conditions	Yes	No	N/A	Notes and Corrective Actions
-----------------	-----	----	-----	------------------------------

Are Off-site flows entering the construction site?				
Is there evidence of polluted discharges off the site?				
Is there evidence of polluted discharges from the site to a state water (e.g. storm drain, ditch, stream, ocean)?				
Is repair, maintenance, or installation of sediment control BMPs needed at the site?				
Is repair, maintenance, or installation of erosion control BMPs needed at the site?				
Are construction materials/debris/trash/soil stored or disposed of properly on site?				
Is there vehicle tracking from the site to receiving streets?				
Do locations exist where additional or revised BMPs are needed?				
Do locations exist where BMPs may no longer be necessary and may be removed?				
Does your site evaluation indicate a need to update or revise the current SSCBMP plan and/or accompanying erosion and sediment control drawings?				

Pictures taken during the SSCBMP inspection documented above are attached.

YES

NO

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false

information, including the possibility of fine and imprisonment for knowing violations.

Duly Authorized Representative Printed Name

Duly Authorized Representative Signature Date

* Duly Authorized Representative as submitted to DOH for NPDES permit

As an inspector, acting on behalf of the Department of Water, County of Kauai, I certify, to the best of my knowledge and belief, that the inspection verified the compliance of the approved and/or amended site specific BMP plan. All other requirements of the NPDES permit approval are the sole responsibility of the contractor, who is the independent contractor, hired to act as a duly authorized representative of the Kauai Department of Water, and I shall not be personally liable for any violations to the approved permit conditions.

DOW Inspector Printed Name

DOW Inspector Signature Date

EXHIBIT O – EMPLOYMENT OF STATE RESIDENTS COMPLIANCE FORM

**CERTIFICATION OF COMPLIANCE
FOR
EMPLOYMENT OF STATE RESIDENTS
ACT 68, SESSION LAWS OF HAWAII 2010**

Project Title: _____

Agency Project No.: _____

Contract No.: _____

As required by Act 68, Session Laws of Hawai'i 2010-Employment of State Residents on Construction Procurement Contracts, I hereby certify under oath, that I am an officer of _____ and for the month of _____, 20____, _____ is in compliance with Act 68, SLH 2010, by employing a workforce of whom not less than eighty percent are Hawai'i residents, as calculated according to the formula in the solicitation, to perform this Contract.

- I am an officer of the **Contractor** for this contract.
- I am an officer of a **Subcontractor** for this contract.

CORPORATE SEAL

(Name of Company)

(Signature)

(Print Name)

(Print Title)

Subscribed and sworn to me before this ____ day of _____, 20____.

Doc. Date: _____ # Pages: _____

Name of Notary: _____, ____ Circuit

Notary Public, ____ Circuit, State of Hawai'i

Doc. Description: _____

My Commission Expires: _____

Notary Signature _____ Date

NOTARY CERTIFICATION

EMPLOYMENT OF STATE RESIDENTS COMPLIANCE FORM (EXHIBIT O)

EXHIBIT P – REQUEST FOR INFORMATION (RFI) FORM

RFI

To: Dustin Moises, P.E.
Kauai Department of Water
4398 Pua Loke Street
Lihue, HI 96766

RFI #:
Date:
Job No.:
Contractor Phone:
Contractor email:

CC:

Subject:

Drawing Sheet #:
Specification Section:
Cost Impact:
Schedule Impact:

Request:
Requested by: _____
Date response required: _____

Response:
Answered by: _____
Company: _____
Date: _____

REQUEST FOR INFORMATION (RFI) FORM (EXHIBIT P)

IFB Job No. 16-04

Appendix D-Insurance

EXHIBIT D

INSURANCE REQUIREMENTS

BOARD OF WATER SUPPLY, COUNTY OF KAUAI

Contractor shall procure and maintain, on primary basis and at its sole expense, at all times during the life of the contract insurance coverages, limits, including endorsements described herein against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work by the Contractor or the Contractor's agents, representatives, employees or subcontractors. The requirements contained herein, as well as the Department of Water, County of Kaua'i's (hereinafter "DOW") review or acceptance of insurance maintained by the Contractor is not intended to and shall not in any manner limit or qualify the liabilities or obligations assumed by the Contractor.

To the extent applicable, the amounts and types of insurance will conform to the minimum terms, conditions and coverage(s) of Insurance Service Office (ISO) policies, forms, and endorsements.

A. General Conditions

Waiver of Subrogation. Contractor shall agree by entering into a contract with the Board of Water Supply, County of Kaua'i (hereinafter "Board") to provide a Waiver of Subrogation for the Commercial General Liability, Automobile Liability, and Workers Compensation policies. When required by the insurer, or should a policy condition not permit Contractor to enter into a pre-loss agreement to waive subrogation without an endorsement, the Contractor shall agree to notify the insurer and request the policy be endorsed with a Waiver of Subrogation in favor of the Board. This Waiver of Subrogation requirement shall not apply to any policy, which includes a condition specifically prohibiting such an endorsement, or voids coverage should Contractor enter into such an agreement on a pre-loss basis.

Additional Insured. Contractor shall agree to endorse the **BOARD OF WATER SUPPLY, COUNTY OF KAUAI as an Additional Insured** with a CG026 Additional Insured – Designated Person or Organization endorsement, a copy of the applicable policy language, or similar endorsement to all required insurance policy(ies), except for Workers Compensation and Professional Liability.

Deductibles and Self-Insured Retentions. Any deductibles or self-insured retentions must be declared to and approved by the DOW. At the option of the DOW, either: the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects the Board; or the Contractor shall provide a financial guarantee (audited financial statement) satisfactory to the Department guaranteeing payment of losses and related investigations, claim administration and defense expenses.

When a self-insured retention (SIR) or deductible exceeds \$50,000, the Department reserves the right, but not the obligation, to review and request a copy of the Contractor's most recent annual report or audited financial statement.

Contractor's Responsibility. The Contractor is responsible for paying any portion of any loss not covered because of the operation of any deductible, co-insurance clause or self-insured retention applicable to the insurance required herein. If the Board is damaged by the failure of the Contractor to maintain insurance as required in this paragraph, then the Contractor shall bear all reasonable costs properly attributable to that failure.

Primary and Non-contributory. All policies required of the Contractor will be endorsed as primary and any insurance or self-insurance program maintained by the Board shall be non-contributory.

Certificate of Insurance. Concurrent with the execution of the contract, Contractor shall provide the Department a certificate of insurance completed by a duly authorized representative of their insurer certifying that the liability coverage(s) is written on an occurrence form. Immediately upon becoming aware that its insurance will be cancelled, non-renewed, or materially changed, Contractor will notify Department by providing written notice.

The Certificate Holder address shall read:

Board of Water Supply, County of Kaua'i
4398 Pua Loke Street, Līhu'e, HI 96766

Attention: Dustin Moises

Contract No.: [Click here to enter text.](#)

Project Title: Job No. 16-04, Water Plan 2020 #WKK-03, MCC, Chlorination Facilities-Kilauea Wells No. 1 and No. 2, Kauai, Hawaii

Concurrent with the execution the contract the Contractor shall furnish the Department with original certificates and endorsements effecting required coverage(s). The Department reserves the right to require complete copies of all required insurance policies, including the policy declarations and endorsements affecting the coverage at any time.

Failure to secure and maintain the required insurance shall be considered as a material breach of the contract. Should the Board be forced to expend funds that would have been covered under the specified insurance, Contractor shall reimburse the Board for such funds. In the event the Board determines, in its sole and absolute discretion, that it is necessary to purchase the coverages herein required of the Contractor, and which the Contractor has failed to secure, the Contractor shall reimburse the Board for the expenditure of such funds.

Right to Revise or Reject. Department reserves the right, but not the obligation, to review and revise any insurance requirement, not limited to limits, coverages and endorsements based on insurance market conditions affecting the availability or affordability of coverage; or changes in the scope of work or specifications affecting the applicability of coverage. Additionally, the Department reserves the right, but not the

obligation, to review and reject any insurance policies failing to meet the criteria stated herein or any insurer providing coverage due to its poor financial condition or failure to operate legally.

B. Minimum Insurance Coverage Requirements

Unless otherwise approved by the Manager and Chief Engineer, the policy or policies of insurance maintained by the Contractor shall provide the following minimum limit(s) and coverage(s) as specified herein and be placed with an insurance carrier authorized to do business in the State of Hawai‘i and rated A-VII by A.M. Best:

Commercial General Liability. The Contractor shall procure and maintain Commercial General Liability, with dedicated required limits, as set forth herein, written on occurrence form providing:

- Designated premises basis OR Per Project basis

The coverages shall include the following:

- Premises Operations
- Independent Contractors
- Products and Completed Operations
- Broad Form Property Damage including completed operations
- Blanket Contractual Liability
- Personal Injury
- Employees named as Additional Insured
- Severability of Interest
- Explosion, Collapse and Underground Property Damage

The minimum limits of liability may be satisfied by providing either:

<p>Bodily Injury and Property Damage Combined Single Limit:</p> <ul style="list-style-type: none"> • \$2,000,000 per occurrence • \$2,000,000 annual aggregate 	<p>OR</p>	<p>Personal Injury:</p> <ul style="list-style-type: none"> • \$1,000,000 per occurrence • \$2,000,000 annual aggregate <p style="text-align: center;">AND</p> <p>Products and Completed Operations:</p> <ul style="list-style-type: none"> • \$1,000,000 per occurrence • \$2,000,000 annual aggregate
---	------------------	---

Contractor must provide evidence the Board is an Additional Insured for Products/Completed Operations coverage for both ongoing operations and after

substantial completion of the work. This coverage may be provided by the ISO form CG 2010 (11 85) or an equivalent policy form. Coverage provided by a non-equivalent CGL form shall be specifically endorsed providing both the course of construction and products/completed operations. ISO CG 2010 (04 13) and ISO form CG 2037 (04 13) or an equivalent form is required from the Contractor. The Contractor and subcontractor(s), if any, shall provide evidence to the Department on an annual basis the products/completed operation coverage is in effect for two (2) years after substantial completion of the project.

Business Automobile Liability. The Contractor shall procure and maintain Business Automobile Liability written on occurrence form for all Owned, Non-owned, and Hired automobiles. If the Contractor does not own automobiles, Contractor shall agree to maintain coverage for Hired & Non-Owned Auto Liability, which may be satisfied by way of endorsement to the Commercial General Liability policy or separate Business Automobile Liability. Coverage shall be for automobile contractual liability, uninsured and underinsured motorist coverage, basic no-fault, and personal injury protection, as required by Hawaii law with the following limits:

Bodily Injury

\$1,000,000 per person
\$1,000,000 per occurrence

Property Damage

\$1,000,000 per accident

Workers' Compensation and Employer's Liability. The Contractor shall procure and maintain at all times during the term of the contract the following insurance liability coverage: Workers' Compensation, Temporary Disability Insurance (TDI), and similar insurance that is required by the State of Hawaii or federal laws. Self-insurance is permitted subject to submission of a copy of the appropriate governmental authorization and qualification by the Contractor and subcontractor(s).

The minimum limits of liability to be maintained are as follows:

Coverage A: State of Hawaii Workers' Compensation Law:

Statutory Limits

Coverage B: Employer's Liability:

Bodily Injury from each accident	\$1,000,000
Bodily Injury from disease	\$1,000,000
Bodily Injury from disease aggregate	\$1,000,000

Builder's Risk. The Contractor shall procure and maintain an Inland Marine Builder's Risk policy providing coverage to protect the interests of the Board, Contractor, sub-contractors, architects, and engineers, including property in transit and property on or off-premises, which shall become part of the building, or Project. Coverage shall be written on an **All Risk, Replacement Cost, and Completed Value Form** basis in an amount at least equal to 100% of the projected completed value of the Project as well as subsequent modifications of that sum, unless an agreed amount is otherwise stated between the Department and the Contractor. The policy shall insure all work, labor, and materials furnished by the Contractor and the Contractor's subcontractors against loss occasioned by fire, lightning, windstorm, theft, vandalism, malicious mischief, flood, earthquake, and collapse.

The amount of coverage for the perils of flood and earthquake may be subject to a sub-limit. The sub-limit shall provide coverage of at least 25% of the full replacement cost.

The policy shall also include coverage for debris removal and reasonable compensation for architect's and engineer's services and expenses required as a result of an insured loss. The Contractor shall endorse the policy with a manuscript endorsement eliminating the automatic termination of coverage in the event the building is occupied in whole or in part, or put to its intended use, or partially accepted by the Department. The manuscript endorsement shall amend the automatic termination clause to only terminate coverage if the policy expires, is cancelled, the Board's interest in the building ceases, or the building is accepted or insured by the Board.

The Contractor shall name the Board of Water Supply, County of Kaua'i as a loss payee on the Builder's Risk policy.

Installation Floater. The Contractor shall procure and maintain an Installation Floater policy providing coverage to protect the interests of the Board, Contractor, sub-contractor(s), architects, and engineers, including property in transit and property on or off-premises, which shall become part of the project.

Coverage shall be written on an All Risk, Replacement Cost, and Completed Value Form basis in an amount at least equal to 100% of the projected completed value of the Project as well as subsequent modifications of that sum, unless an agreed amount is otherwise stated between the Department and the Contractor. The policy shall insure all work, labor, and materials furnished by the Contractor and the Contractor's subcontractors against loss occasioned by fire, lightning, windstorm, theft, vandalism, malicious mischief, flood, earthquake, and collapse.

The amount of coverage for the perils of flood and earthquake may be subject to a sub-limit. The sub-limit shall provide coverage of at least 25% of the full replacement cost.

The policy shall also include coverage for debris removal and reasonable compensation for architect's and engineer's services and expenses required as a result of an insured loss. The Contractor shall endorse the policy with a manuscript endorsement eliminating

the automatic termination of coverage in the event the building is occupied in whole or in part, or put to its intended use, or partially accepted by the Department. The manuscript endorsement shall amend the automatic termination clause to only terminate coverage if the policy expires, is cancelled, the Board's interest in the building ceases, or the building is accepted or insured by the Board.

The Contractor shall name the Board of Water Supply, County of Kauai as a loss payee on the Installation Floater policy.

Professional Liability (Errors and Omissions). The Contractor and its subcontractors shall procure and maintain Professional Liability Insurance (Errors and Omissions Insurance) that covers all such activities under the contract. Such insurance shall have these minimum limits and coverage(s):

\$1,000,000 per occurrence
\$2,000,000 annual aggregate

For policies written on a "Claims-Made" basis, Contractor warrants the retroactive date equals or precedes the effective date of the contract. In the event the policy is canceled, non-renewed, switched to an Occurrence Form, retroactive date advanced; or any other event triggering the right to purchase a Supplemental Extended Reporting Period (SERP) during the life of the contract, Contractor shall agree to purchase Supplement Extended Reporting Period (SERP) with a minimum reporting period not less than two (2) years. The requirement to purchase a SERP shall not relieve Contractor of the obligation to provide replacement coverage.

Pollution Legal Liability. The Contractor shall procure and maintain Pollution Liability or similar Environmental Impairment Liability at a minimum limit not less than:

\$1,000,000 per occurrence
\$2,000,000 annual aggregate

The policy shall provide coverage for damages against, but not limited to, third-party liability, clean-up, corrective action including assessment, remediation and defense costs.

Contractor's Pollution Liability. Contractor shall procure and maintain pollution liability insurance when the Scope of Work involves removal, abatement, encapsulation or other treatment, disposal or remediation of asbestos or other hazardous materials or an exposure to pollutants or impairment of the environment. The policy shall provide coverage for third party liability, clean-up, and corrective action including assessment remediation and defense costs. The policy may be written on either an occurrence form or claims made. The minimum limits of liability shall be:

\$1,000,000 per occurrence
\$2,000,000 annual aggregate

Crime Insurance or Commercial Fidelity Bond. Contractor shall procure and maintain Commercial Crime Insurance or Fidelity Bond providing Employee Dishonesty on a blanket basis covering all of the Contractor’s employees with a minimum amount of insurance at least equal to the amount of the contract. The policy shall be endorsed to cover “Third-Party Liability” including a third-party beneficiary clause in favor of the Board. The policy shall include a minimum twelve (12) month “Discovery Period” when written on a Loss Sustained basis.

Property. The Tenant or Lessee, shall agree to maintain property insurance including flood and windstorm written on a replacement cost basis in an amount not less than 100% of the replacement cost of the building(s) and contents, including betterments and improvements made by the Tenant or Lessee, located on the premises. Contractor shall agree to be fully responsible for any deductible or self-insured retention, and to provide this coverage on primary basis.

Umbrella or Excess Liability. Contractor may satisfy the minimum liability limits required above under an Umbrella or Excess Liability policy with \$1,000,000 per occurrence and \$2,000,000 aggregate. If Contractor is using its Umbrella or Excess Liability Insurance policy to satisfy the minimum requirements, Contractor shall agree to endorse the Board of Water Supply, County of Kaua’i as “Additional Insured” on the Umbrella or Excess Liability policy, or shall confirm in writing that its Umbrella or Excess Liability policy “follows form.”

LETTER OF TRANSMITTAL

**DISABILITY AND COMMUNICATION
ACCESS BOARD
1010 Richards Street,
Room 118
Honolulu, Hawaii 96813**

**(808) 586-8104
Fax # 586-8129**

To:

**County of Kauai, Department of Water
4398 Pua Loke Street
Lihue, Hawaii 96766**

DATE	12 February 2018	DCAB #	2018-78
ATTENTION:	Bryan Wienand		
RE	MCC Chlorination Facilities Kilauea Wells No. 1 and No. 2		

WE ARE SENDING YOU (*) Attached the following items:

COPIES	DATE	NO	DESCRIPTION
1	12 February 2018	1 page	Document Review

THESE ARE TRANSMITTED as checked below:

- Transmitted via facsimile
- Transmitted via email bwienand@kauaiwater.org
- Drawings and/or specifications returned to consultant/department

SIGNED _____


Laurie Palenske
Facility Access Specialist

cc via email:

Andrea Cheung
Brown and Caldwell
737 Bishop Street, Ste. 3000
Honolulu, Hawaii 96813
acheung@brwncauld.com



DISABILITY AND COMMUNICATION ACCESS BOARD

1010 Richards Street, Room 118 • Honolulu, Hawaii 96813
Ph. (808) 586-8121 (V) • (808) 586-8162 (TTY) • Fax (808) 586-8129

DOCUMENT REVIEW

12 February 2018

MCC Chlorination Facilities Kilauea Wells No. 1 and No. 2

DCAB Job #: 2018-78
Project #: 16-4; WP2020, WKK-03
Department/Agency: County of Kauai, Department of Water
Bryan Wienand
Design Firm: Brown and Caldwell
Andrea Cheung
Documents Reviewed: 55 sheets of subject project received February 8, 2018
Specifications received - February 8, 2018
Document transmittal Form dated February 8, 2018
Previous Review(s): n/a

The documents submitted do not indicate any construction requiring the application of the 2004 Americans with Disabilities Act Accessibility Guidelines (2004 ADAAG) and other applicable design standards, as required by Hawaii Revised Statutes (HRS) 103-50.

The above constitutes review and recommendations on this project to determine whether or not the building or facility is designed in accordance with the 2004 ADAAG and other applicable design standards, per HRS 103-50. Final responsibility to comply with HRS 103-50 rests with the State or County agency overseeing the project.

Reviewed by:

Laurie Palenske
Facility Access Specialist

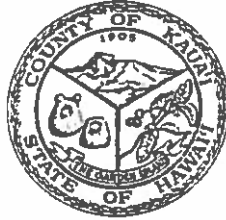
cc via email:

Andrea Cheung
Brown and Caldwell

Donna Apisa
Chair

Glenda Nogami Streufert
Vice-Chair

Kanoe Ahuna
Roy Ho
Kimo M. Keawe
Sean Mahoney
Members



Michael A. Dahilig
Clerk of the Commission

PLANNING COMMISSION
County of Kaua'i, State of Hawai'i
4444 Rice Street
Kapule Building, Suite A-473
Līhu'e, Hawai'i 96766-1326
TEL (808) 241-4050 FAX (808) 241-6699

MAY 24 2018

Laurel Loo, Esq.
SHIRAMIZU LOO & NAKAMURA, LLLP.
4357 Rice Street, Suite 102
Līhu'e, Hawai'i 96766

Subject: Class IV Zoning Permit Z-IV-2018-6
Use Permit U-2018-5
Special Permit SP-2018-3
Tax Map Key: (4) 5-2-002:013
Kīlauea, Kaua'i
COK DEPARTMENT OF WATER, Applicant

Dear Ms. Loo,

This letter memorializes the action taken by the Kaua'i Planning Commission effective MAY 22, 2018 concerning approval of the above subject permits authorizing the construction of a new emergency shelter, replacement of an existing well pump and associated site improvements at the existing Kīlauea Wells Nos. 1 & 2 site. The approval, per your consent, is subject to the following conditions:

1. The proposed facility shall be constructed as represented. Any changes to said structures and/or facilities shall be reviewed by the Planning Department to determine whether Planning Commission review and approval is warranted.
2. In order to further ensure that the project is compatible with its surroundings and to minimize the visual impact of the structure, the external color of the tank shall be of a moderate to dark earth-tone color. The proposed color scheme shall be submitted to the Planning Department for review and acceptance prior to building permit application.

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Laurel Loo, Esq.
SHIRAMIZU LOO & NAKAMURA, LLLP.
Proposed Water System Improvements
Class IV Zoning Permit Z-IV-2018-6
Use Permit U-2018-5
Special Permit SP-2018-3
Page | 2

3. In order to minimize adverse impacts on the Federally Listed Threatened Species, Newell's Shearwater and other seabirds, if external lighting is to be used in connection with the proposed project, all external lighting shall be only of the following types: downward-facing, shielded lights. Spotlights aimed upward or spotlighting of structures shall be prohibited.
4. The Applicant shall comply with the requirements of the State Department of Health (DOH), the County Departments of Public Works and Water, as well as any other applicable government agency(ies).
5. The Applicant is advised that should any archaeological or historical resources be discovered during ground disturbing/construction work, all work in the area of the archaeological/historical findings shall immediately cease and the Applicant shall contact the State Department of Land and Natural Resources – Historic Preservation Division at (808) 692-8015 and the Planning Department at (808) 241-4050.
6. The Applicant shall develop and utilize Best Management Practices (BMP's) during all phases of development in order to minimize erosion, dust, and sedimentation impacts of the project to abutting properties.
7. The Planning Commission reserves the authority to impose additional conditions, modify or delete conditions stated herein, or revoke the permits through proper procedures should the Applicant fail to comply with the conditions of approval.
8. The Applicant is advised that additional government agency conditions may be imposed. It shall be the Applicant's responsibility to resolve those conditions with the respective agency(ies).

If you have further questions regarding this matter, please contact Dale A. Cua of my staff at (808) 241-4050.

Laurel Loo, Esq.
SHIRAMIZU LOO & NAKAMURA, LLLP.
Proposed Water System Improvements
Class IV Zoning Permit Z-IV-2018-6
Use Permit U-2018-5
Special Permit SP-2018-3
Page | 3

Sincerely Yours,

A handwritten signature in blue ink, appearing to read "Michael A. Dahilig". The signature is fluid and cursive, with a large initial "M" and a long, sweeping underline.

MICHAEL A. DAHILIG
Clerk, Kaua'i Planning Commission

xc: COK – Public Works, Fire, Water, Finance-Real Property Division
State Health Dept.

WP2020 JOB NO. WKK-03
DEPARTMENT OF WATER
COUNTY OF KAUA'I
MCC, CHLORINATION FACILITIES -
KĪLAUEA WELLS NO. 1 AND NO. 2

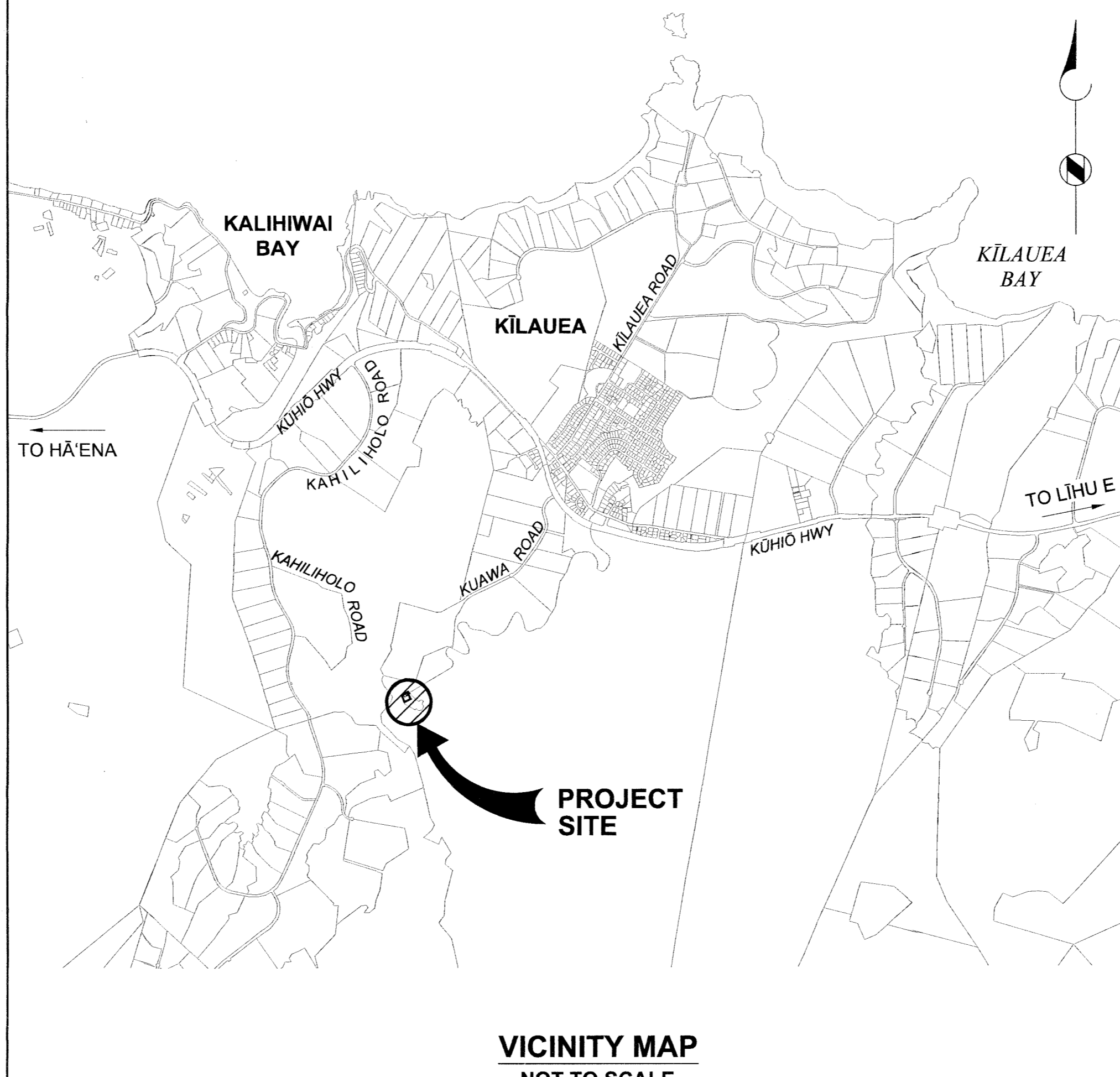
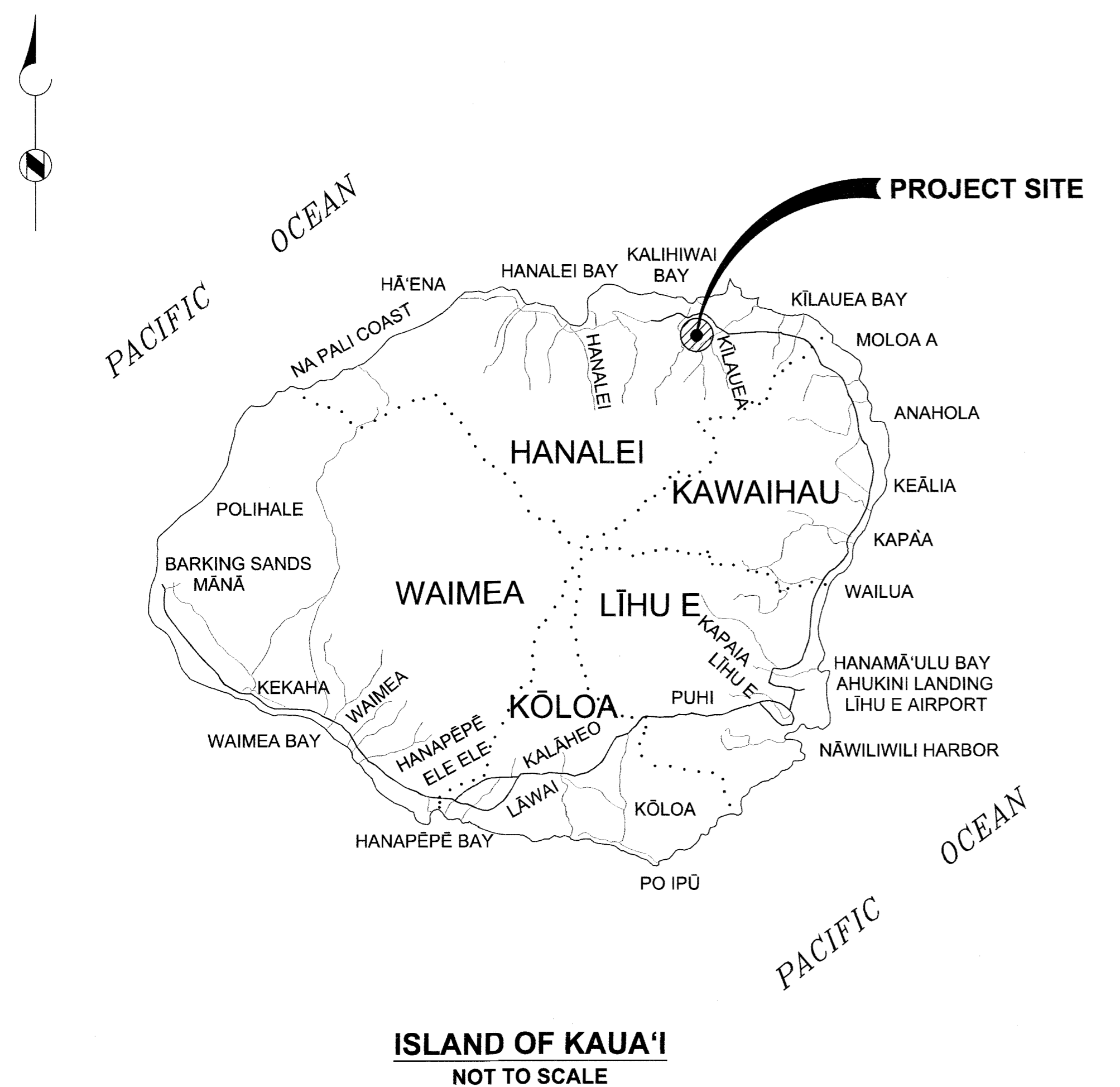
TMK: (4) 5-2-002:013
KĪLAUEA, KAUA'I, HAWAII

PREPARED BY:
Brown and Caldwell
737 BISHOP STREET, SUITE 3000
HONOLULU, HI 96813

LOCATION MAP

VICINITY MAP

APPROVALS



[Signature]
for MANAGER AND CHIEF ENGINEER, DEPARTMENT OF WATER
COUNTY OF KAUA'I

3/11/19
DATE

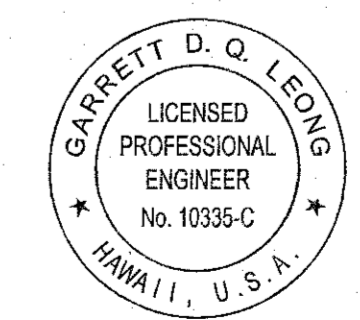

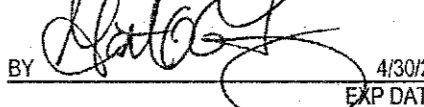
[Signature]
KAUĀ'I ISLAND UTILITY COOPERATIVE (KIUC)
APPROVAL SIGNATURE

2/27/19
DATE

JOB NO. WKK-03, MCC, CHLORINATION FACILITIES, KILAUEA WELLS NO. 1 AND NO. 2

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53	E-231	TYPICAL WELL PUMP CONTROL DIAGRAM - 1			

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)	REVISION: DATE: BY: APPROVED:
 <p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.)</p>	DEPARTMENT OF WATER COUNTY OF KAUAI JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2 KĪLAUEA, KAUAI, HAWAII
	INDEX OF DRAWINGS DESIGNED BY: AC DRAWN BY: YN CHECKED BY: GL
	APPROVED BY:  DATE: 3/11/19 <small>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</small>
BY:  4/30/20 EXP. DATE	SHEET 2 OF 60 SHEETS G-001

Path: \\BCHON\F001\Projects\Projects\Kauai, County Of (H)\150756 Kilauea Wells MCC Design\400 Design\CADD\SHEETS\G-GENERAL Filename: 150756-SF-G-001-150756-SF-G-001.dwg Plot Date: January 31, 2019 - 8:55 AM CADD User: Yolanda Noda

GENERAL CONSTRUCTION NOTES

- ALL CONSTRUCTION WORK IS TO BE CONSTRUCTED IN ACCORDANCE WITH THE PUBLICATIONS "HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2005," AND ITS AMENDMENTS AND "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION SEPTEMBER 1984," AS AMENDED OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, AND THE COUNTIES OF KAUAI, MAUI AND HAWAII. THE STANDARD DETAILS ARE AVAILABLE AT THE COUNTY OF KAUAI CLERK'S OFFICE.
- NO GRADING BETWEEN 7 P.M. TO 7 A.M. ON ANY GIVEN DAY OR ON SATURDAYS, SUNDAYS AND HOLIDAYS WITHOUT WRITTEN PERMISSION FROM THE COUNTY ENGINEER AND THE STATE DEPARTMENT OF HEALTH.
- CONTRACTOR TO NOTIFY PUBLIC WORKS DEPARTMENT FIVE (5) BUSINESS DAYS PRIOR TO COMMENCING ANY GRADING WORK. WHEN COMPLETED AND READY FOR FINAL INSPECTION, NOTIFY PUBLIC WORKS DEPARTMENT INSPECTION SECTION.
- CONSTRUCTION PLANS ARE VALID FOR A PERIOD OF ONE YEAR FROM THE DATE OF APPROVAL; IF CONSTRUCTION DOES NOT COMMENCE WITHIN THIS ONE-YEAR TIME FROM THE DATE OF APPROVAL, THE CONSTRUCTION PLANS WILL NEED TO BE RESUBMITTED TO ALL REVIEWING AND APPROVING AGENCIES FOR RECERTIFICATION OF THE PLAN.
- ALL GRADING, GRUBBING AND STOCKPILING WORK SHALL BE PERFORMED IN ACCORDANCE WITH COUNTY OF KAUAI ORDINANCE NO. 808.
- AFTER EACH RAINFALL EVENT, THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS RESULTING FROM HIS WORK AND DEPOSITED IN DRAINAGE FACILITIES, ROADWAYS AND OTHER AREAS. THE COST INCURRED FOR ANY NECESSARY REMEDIAL ACTION BY THE COUNTY ENGINEER SHALL BE PAYABLE BY THE CONTRACTOR.
- DURING CLEANING OPERATIONS, THE CONTRACTOR SHALL SUPPLY A WATER TRUCK FOR DUST CONTROL PURPOSES UNTIL VEGETATION HAS RE-ESTABLISHED ITSELF. EXCESS WATER, INCLUDING SILT AND DIRT SHALL NOT BE ALLOWED TO RUN-OFF THE PROPERTY.
- BENCHMARKS THAT ARE DISTURBED OR DESTROYED SHALL BE RESTORED UNDER A LICENSED LAND SURVEYOR'S DIRECTION. COPIES OF FIELD NOTES, DESCRIPTIONS AND NEW VALUES OF THE NEW BENCHMARK SHALL BE SENT TO THE DEPARTMENT OF PUBLIC WORKS SURVEY SECTION FOR REVIEW AND APPROVAL PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OVERTIME AND/OR NIGHT WORK PAYMENTS FOR THE COUNTY'S STAFF AND INSPECTION PERSONNEL INCLUDING CONSULTANTS, WHEN THE CONTRACT REQUIRES OVERTIME OR NIGHT WORK TO BE PERFORMED, OR DIRECTS THE CONTRACTOR TO WORK ADDITIONAL SHIFTS OR OVERTIME FOR COUNTY'S CONVENIENCE.
- BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE EMPLOYED AT ALL TIMES TO THE MAXIMUM EXTENT PRACTICABLE TO PREVENT DAMAGE AND/OR NUISANCE BY SEDIMENTATION, EROSION OR DUST TO STREAMS, WATERCOURSES, NATURAL AREAS AND THE PROPERTY OF OTHERS.
- SURVEYS SHALL BE DONE UNDER THE SUPERVISION OF A LAND SURVEYOR LICENSED IN THE STATE OF HAWAII.
- IF SYSTEM CONDITIONS REQUIRE NON-EMERGENCY NIGHTTIME WORK DURING THE AUTUMN SEABIRD FALL SEASON (SEPTEMBER 15 THROUGH DECEMBER 15), USE OF LIGHTING WILL BE RESTRICTED BETWEEN 9:00 PM TO 4:30 AM. IF LIGHTING OF THE WORK AREA IS REQUIRED IN SUCH SITUATION, ALL LIGHTS WILL BE SHIELDED (MINIMUM LIGHT SPILL TOWARDS THE SKY) AND DIRECTED DOWNWARDS TO THE MAXIMUM EXTENT PRACTICABLE. MINIMUM REQUIREMENTS FOR LIGHTING BY HIOSH AND OSHA WILL BE PROVIDED AND ASSURED BY THE CONTRACTOR. THE CONTRACTOR SHALL TRAIN ALL EMPLOYEES WORKING AT NIGHT (RECORDS RETAINED BY THE CONTRACTOR) IN HOW TO HANDLE ANY DOWNED BIRDS AND WILL HAVE APPROPRIATE EQUIPMENT AS APPROVED BY SAVE OUR SHEARWATERS (SOS) ON SITE TO HOLD AND TRANSPORT ANY RETRIEVED DOWNED BIRDS TO AN SOS FACILITY. THIS REQUIREMENT DOES NOT ALLOW LIGHTING AS MAY RESTRICTED BY OTHER GOVERNMENT AGENCIES.
- PRIOR TO STARTING ANY EXCAVATION ACTIVITIES, THE CONTRACTOR SHALL CONTACT THE HAWAII ONE CALL CENTER AT 1-866-423-7287.
- PRIOR TO INSTALLATION OF ANY NEW SEWER LINES, DRAIN LINES, MANHOLES, AND STRUCTURES THAT WILL BE TRANSFERRED TO THE COUNTY OR REQUIRED FOR THE SUBDIVISION OF THE PROPERTY, THE CONTRACTOR SHALL HAVE ALL IMPROVEMENTS (MAINS, PIPES, APPURTENANCES AND STRUCTURES) SURVEYED AND STAKED OUT BY A LICENSED PROFESSIONAL LAND SURVEYOR AND THE CONTRACTOR SHALL EXPOSE, VERIFY, AND BACKFILL ALL EXISTING UNDERGROUND UTILITIES AND STRUCTURES IN CLOSE PROXIMITY TO CROSSINGS AND CONNECTIONS PRIOR TO EXCAVATION OF PIPELINE TRENCH. CONTRACTOR SHALL PROVIDE THE LICENSED SURVEYOR CUT SHEET AND PROBING INFORMATION TO THE PUBLIC WORKS ENGINEERING CONSTRUCTION ENGINEER FOR REVIEW AND APPROVAL BEFORE MOVING FORWARD WITH INSTALLATION VIA THE SUBMITTAL REVIEW PROCESS.
- PRIOR TO INSTALLATION OF FINAL ROADWAY IMPROVEMENTS (SUBGRADE, BASE COURSE, AND FINAL CONCRETE OR AC PAVEMENT, CURBS, GUTTERS, SIDEWALK, ETC.) AND/OR ANY NEW RIGHT OF WAY IMPROVEMENTS THAT WILL BE TRANSFERRED TO THE COUNTY OR REQUIRED FOR THE SUBDIVISION OF THE PROPERTY, THE CONTRACTOR SHALL HAVE ALL IMPROVEMENTS SURVEYED AND STAKED OUT BY A LICENSED PROFESSIONAL LAND SURVEYOR AND THE CONTRACTOR SHALL EXPOSE, VERIFY, AND BACKFILL ALL EXISTING UNDERGROUND UTILITIES AND STRUCTURES IN CLOSE PROXIMITY TO

- CONNECTIONS PRIOR TO ESTABLISHING ROAD SUBGRADE. CONTRACTOR SHALL PROVIDE THE LICENSED SURVEYOR ROAD CENTERLINE (AND/OR CURB OFFSETS) CUT SHEET OF FINAL SUBGRADE TO THE PUBLIC WORKS ENGINEERING CONSTRUCTION ENGINEER FOR REVIEW AND APPROVAL BEFORE MOVING FORWARD WITH THE INSTALLATION VIA THE SUBMITTAL REVIEW PROCESS.
- THE DEPARTMENT OF PUBLIC WORKS SHALL BE PROVIDED TWENTY (20) WORKING DAYS FOR ALL SUBMITTAL REVIEWS FROM THE TIME OF SUBMISSION BY THE CONTRACTOR.
- THE DEPARTMENT OF PUBLIC WORKS SHALL HAVE ACCESS TO THE WORK AT ALL TIMES DURING CONSTRUCTION AND SHALL BE FURNISHED WITH EVERY REASONABLE FACILITY (INCLUDING BUT NOT LIMITED TO LAYOUT UNDER THE SUPERVISION OF A LAND SURVEYOR LICENSED IN THE STATE OF HAWAII) FOR ASCERTAINING THAT THE MATERIALS USED AND THE WORKMANSHIP ARE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CHAPTER 9 SUBDIVISION ORDINANCE; ORDINANCE NO. 808, ARTICLE 7, GRADING, GRUBBING AND STOCKPILING; AND THE STANDARDS ESTABLISHED BY THE DEPARTMENT OF PUBLIC WORKS.
- FOR GRADING WORK EXCEEDING ONE (1) ACRE, WITH EMBANKMENTS IN EXCESS OF FIVE HUNDRED (500) CUBIC YARDS, AND WITH A DEPTH OF MORE THAN FOUR (4) FEET, THE CONTRACTOR SHALL RETAIN THE SERVICES OF A GEOTECHNICAL ENGINEER FOR QUALITY CONTROL. CERTIFICATION FROM THE GEOTECHNICAL ENGINEER SHALL BE SUBMITTED TO THE DEPARTMENT OF PUBLIC WORKS AT THE COMPLETION OF THE GRADING WORK. THE GEOTECHNICAL ENGINEER SHALL CERTIFY THAT THE GRADING WORK MEETS THE REQUIREMENTS OF THE "HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2005" AND ITS AMENDMENTS; THE "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, COUNTY OF KAUAI, CITY AND COUNTY OF HONOLULU, COUNTY OF MAUI, AND THE COUNTY OF HAWAII DATED SEPTEMBER 1984" OR AS AMENDED; ORDINANCE NO. 808, ARTICLE 7, GRADING GRUBBING AND STOCKPILING; AND THE APPROVED CONSTRUCTION PLANS. THE GEOTECHNICAL ENGINEER SHALL ALSO SUBMIT TEST RESULTS AS REQUESTED BY THE DEPARTMENT OF PUBLIC WORKS.

NOTES FOR CONSTRUCTION WITHIN COUNTY RIGHT-OF-WAY

- ALL PAVEMENT SHALL BE RESTORED TO ITS ORIGINAL CONDITION IN ACCORDANCE WITH COUNTY OF KAUAI, "HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2005" AND ITS AMENDMENTS WITH 2" MINIMUM A.C. AND 8" BASE COURSE AND THE "STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, SEPTEMBER 1984," AS AMENDED OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, AND THE COUNTIES OF KAUAI, MAUI, AND HAWAII.
- THE CONTRACTOR SHALL PROVIDE, INSTALL, MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES, AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION AND FOR THE CONVENIENCE AND SAFETY OF THE PUBLIC TRAFFIC. ALL SUCH PROTECTIVE FACILITIES, AND PRECAUTIONS TO BE TAKEN SHALL CONFORM WITH THE RULES AND REGULATIONS GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS ADOPTED BY THE HIGHWAY SAFETY COORDINATOR AND U.S. FEDERAL HIGHWAY ADMINISTRATION MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS DATED 2009 AND ITS AMENDMENTS.
- THE CONTRACTOR SHALL WHENEVER NECESSARY, PROPERLY SHEET AND BRACE ALL EXCAVATIONS TO RENDER IT SECURE AND SHALL REMOVE ALL SUCH SHEETING AND BRACING BEFORE COMPLETION OF THE BACKFILL FOR WATER MAINS. THE MINIMUM COVER REQUIREMENTS (FROM TOP OF PIPE TO FINISHED GRADE OVER PIPE) IS THREE (3) FEET.
- A PERMIT SHALL BE OBTAINED BY THE CONTRACTOR FROM THE DEPARTMENT OF PUBLIC WORKS, AT THE CONTRACTOR'S EXPENSE.
- DRIVEWAYS SHALL BE KEPT OPEN UNLESS OWNERS OF THE ABUTTING LOTS USING THESE RIGHT-OF-WAY ARE OTHERWISE PROVIDED FOR SATISFACTORILY.
- ALL WORK INCLUDING REPAIR OF DAMAGED PAVEMENT AND SHOULDERS SHALL BE INSPECTED AND APPROVED BY THE DEPARTMENT OF PUBLIC WORKS. ALL UNAPPROVED WORK SHALL BE CONSIDERED UNACCEPTABLE AND SHALL BE REWORKED AND CORRECTED AS DIRECTED BY THE DEPARTMENT OF PUBLIC WORKS, AT THE CONTRACTOR'S EXPENSE.
- DAMAGED SHOULDERS SHALL BE RESTORED TO A CONDITION EQUAL TO OR BETTER THAN EXISTING CONDITION.
- WORK ON A PUBLIC STREET AREA MAY BE PERFORMED ONLY BETWEEN THE HOURS OF 8:00 A.M. TO 3:30 P.M. MONDAY THROUGH FRIDAY, EXCEPT ON HOLIDAYS RECOGNIZED BY THE COUNTY OF KAUAI AND COUNTY FURLOUGH DAYS, UNLESS OTHERWISE PERMITTED IN WRITING BY THE COUNTY ENGINEER.
- DURING NON-WORKING HOURS, ALL TRENCHES SHALL BE COVERED WITH A SAFE NON-SKID BRIDGING MATERIAL AND ALL LANES SHALL BE OPENED TO PUBLIC VEHICULAR AND PEDESTRIAN TRAFFIC.
- NO MATERIAL AND/OR EQUIPMENT SHALL BE STOCKPILED OR OTHERWISE STORED WITHIN COUNTY RIGHT-OF-WAY EXCEPT AT LOCATIONS DESIGNATED IN WRITING AND APPROVED BY THE COUNTY ENGINEER.
- THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS SO AS TO OFFER THE LEAST POSSIBLE OBSTRUCTIONS AND INCONVENIENCE TO THE PUBLIC AND HE SHALL HAVE UNDER CONSTRUCTION NO GREATER LENGTH OR AMOUNT OF WORK THAT HE CAN EXECUTE PROPERLY WITH DUE REGARDS TO THE RIGHTS OF THE PUBLIC.
- ALL EXISTING DRAINAGE FLOW CONDITIONS SHALL BE MAINTAINED.

- THE CONTRACTOR SHALL RETAIN THE SERVICES OF A GEOTECHNICAL ENGINEER FOR QUALITY CONTROL. CERTIFICATION FROM THE GEOTECHNICAL ENGINEER SHALL BE SUBMITTED TO THE DEPARTMENT OF PUBLIC WORKS AT THE COMPLETION OF THE CONSTRUCTION WORK. THE GEOTECHNICAL ENGINEER SHALL ALSO SUBMIT TEST RESULTS AS REQUESTED BY THE DEPARTMENT OF PUBLIC WORKS.
- THE CONTRACTOR SHALL HOLD A PRECONSTRUCTION MEETING WITH THE CONSTRUCTION - INSPECTION AND DESIGN SECTIONS OF THE DEPARTMENT OF PUBLIC WORKS BEFORE COMMENCING ANY WORK.
- THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION TO PRESERVE BENCHMARKS (SURVEY MONUMENTS) WHENEVER THE CENTER OF A SURVEY MONUMENT IS LESS THAN THREE (3) FEET FROM THE EDGE OF CONSTRUCTION. THE CONTRACTOR SHALL RETAIN A LICENSED SURVEYOR TO REFERENCE THE LOCATION OF SAID SURVEY MONUMENT.
- BENCHMARKS THAT ARE DISTURBED OR DESTROYED SHALL BE RESTORED UNDER A LICENSED LAND SURVEYOR'S DIRECTION. COPIES OF FIELD NOTES, DESCRIPTIONS AND NEW VALUES OF THE NEW BENCH MARK SHALL BE SENT TO THE DEPARTMENT OF PUBLIC WORKS SURVEY SECTION FOR REVIEW AND APPROVAL PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL OVERTIME OR NIGHT WORK PAYMENTS FOR COUNTY'S STAFF AND INSPECTION PERSONNEL INCLUDING CONSULTANTS WHEN THE CONTRACT REQUIRES OVERTIME OR NIGHT WORK TO BE PERFORMED, OR DIRECTS THE CONTRACTOR TO WORK ADDITIONAL SHIFTS OR OVERTIME FOR COUNTY'S CONVENIENCE.

WATER CONSTRUCTION NOTES

- UNLESS OTHERWISE SPECIFIED, ALL MATERIALS AND CONSTRUCTION OF WATER FACILITIES AND APPURTENANCES SHALL BE IN ACCORDANCE WITH THE "WATER SYSTEM STANDARDS, 2002" AS ADOPTED BY THE DEPARTMENT OF WATER, COUNTY OF KAUAI, INCLUDING ALL SUBSEQUENT AMENDMENTS AND ADDITIONS.
- ALL REQUIRED PROJECT SUBMITTALS (MATERIALS, SHOP DRAWINGS, CHLORINATION PLAN, ETC.) SHALL BE APPROVED BY THE DEPARTMENT CONSTRUCTION MANAGEMENT DIVISION BEFORE A PRE-CONSTRUCTION CONFERENCE CAN BE SCHEDULED. ONCE ALL PROJECT SUBMITTALS HAVE BEEN APPROVED BY DOW CONSTRUCTION ENGINEER, THE DOW CONSTRUCTION ENGINEER WILL NOTIFY THE CONTRACTOR THAT A PRECONSTRUCTION CONFERENCE CAN BE ARRANGED. THE CONTRACTOR SHALL ARRANGE A PRE-CONSTRUCTION CONFERENCE AT LEAST TEN (10) CALENDAR DAYS BEFORE CONSTRUCTION AND SHALL NOTIFY THE DEPARTMENT OF WATER AT LEAST THREE (3) WORKING DAYS PRIOR TO START OF CONSTRUCTION.
- THE CONTRACTOR SHALL SUBMIT THE NAMES AND TELEPHONE NUMBERS OF ITS AUTHORIZED JOB SUPERINTENDENT AND AT LEAST THREE (3) ADDITIONAL PERSONS TO CONTACT IN CASE OF AN EMERGENCY DURING NON-WORKING HOURS.
- THE CONTRACTOR SHALL NOTIFY THE DEPARTMENT OF WATER AT LEAST TWENTY-FOUR (24) HOURS PRIOR TO ANY TRENCHING, PIPE LAYING, BACKFILLING, TESTING OR DISINFECTION ACTIVITIES TO ENSURE THAT INSPECTION SERVICES WILL BE AVAILABLE.
- ALL MATERIALS (PIPE, LUBRICANTS, PAINTS, SEALANTS, FORM OIL, CONCRETE ADMIXTURES, ETC.) IN DIRECT CONTACT WITH THE POTABLE WATER SHALL HAVE NATIONAL SANITATION FOUNDATION (NSF) CERTIFICATIONS. THE CONTRACTOR SHALL SUBMIT THESE CERTIFICATIONS TO THE DEPARTMENT OF WATER FOR REVIEW AND APPROVAL PRIOR TO ITS APPLICATION.
- THE LOCATION OF EXISTING WATER MAINS AND APPURTENANCES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATIONS IN THE FIELD. EXCAVATION AROUND ANY EXISTING WATER MAIN SHALL BE DONE BY HAND.
- THE CONTRACTOR SHALL PROVIDE UNOBSTRUCTED ACCESS TO EXISTING HYDRANTS, VALVES AND WATER METERS AT ALL TIMES.
- THE CONTRACTOR SHALL SECURE ALL EXCAVATIONS IN ACCORDANCE WITH OSHA REGULATIONS.
- THERE SHALL BE NO PHYSICAL CONNECTION BETWEEN A PUBLIC OR PRIVATE POTABLE WATER SYSTEM AND A NON-POTABLE WATER SYSTEM, SEWER, OR APPURTENANCE THERETO WHICH COULD PERMIT THE PASSAGE OF ANY SEWAGE OR POLLUTED WATER INTO THE POTABLE WATER SUPPLY.
- TRENCH EXCAVATION, BACKFILLING IN LIFTS, AND REPAVING SHALL CONFORM TO THE "HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2005" AS AMENDED.
- WARNING TAPE SHALL BE IN ACCORDANCE WITH DIVISION 200, SECTION 212.08 OF THE "WATER SYSTEM STANDARDS." THE WARNING TAPE SHALL BE FOUR MIL THICK, NON-METALLIC, ACID AND ALKALI RESISTANT POLYETHYLENE AND 6-INCHES WIDE WITH MINIMUM STRENGTH OF 1750 PSI LENGTHWISE AND 1500 PSI CROSSWISE. TAPE COLOR SHALL BE "SAFETY PRECAUTION BLUE" AND SHALL BEAR A CONTINUOUS PRINTED INSCRIPTION "CAUTION WATER LINE BURIED BELOW". INSCRIPTION SHALL BE 2-INCHES HIGH, BLACK TEXT.
- ALL HYDRANTS SHALL RECEIVE A MINIMUM SSPC SP3 SURFACE PREPARATION AND COATED IN ACCORDANCE WITH DIVISION 200, SECTION 206.01 OF THE "WATER SYSTEM STANDARDS."

- UNLESS OTHERWISE DIRECTED, PRIOR TO THE CONNECTION OF ANY PIPELINES AND/OR LATERALS TO THE EXISTING MAIN, THE PIPELINES/LATERALS INSTALLED SHALL BE CLEANED, PRESSURE TESTED, CHLORINATED, FLUSHED, AND SAMPLED IN ACCORDANCE WITH DIVISION 300, SECTIONS 302.27 TO 302.29 OF THE "WATER SYSTEM STANDARDS."

WATER SAMPLES SHALL BE TESTED FOR TOTAL COLIFORMS BY A LABORATORY CERTIFIED BY THE STATE OF HAWAII TO PERFORM COLIFORM ANALYSIS. RESENCE OF COLIFORM BACTERIA IS UNACCEPTABLE.

IN ADDITION TO THE TEST FOR COLIFORMS, A SEPARATE TEST FOR HETEROTROPHIC PLATE COUNT (HPC) SHALL BE CONDUCTED. THE HPC COUNT SHALL BE LESS THAN 300 CFU/ML.

PRIOR TO CHLORINATION, A WATER CHLORINATION AND SANITATION CONTRACTOR WITH A C-37D LICENSE SHALL SUBMIT A CHLORINATION PLAN WITH WATER SOURCE, INJECTION POINTS, SAMPLING POINTS AND PROCEDURE CLEARLY DEFINED FOR APPROVAL BY THE DOW.

THE TESTED PIPELINES AND/OR LATERALS MUST BE CONNECTED TO THE EXISTING DOW SYSTEM WITHIN FOURTEEN (14) CALENDAR DAYS OF PULLING THE FIRST DISINFECTION SAMPLE TESTED BY A CERTIFIED LABORATORY. THE DEPARTMENT OF WATER WILL REQUIRE THE CONTRACTOR TO REDO THE CLEANING, PRESSURE TESTING, AND/OR DISINFECTION OF THE PIPELINES AND/OR LATERALS AT THE CONTRACTOR'S EXPENSE IF THE CONNECTION IS NOT COMPLETED WITHIN THESE 14 CALENDAR DAYS.

POLYURETHANE FOAM "PIGS" SHALL BE "PUSHED" THROUGH THE LENGTH OF THE INSTALLED PIPELINE USING PRESSURIZED WATER.

- ALL CONNECTIONS SHALL BE SCHEDULED IN COORDINATION WITH THE DEPARTMENT OF WATER.
 - AN ADVANCE DEPOSIT IS REQUIRED FOR OPERATING VALVES, FLUSHING LINES AND NOTIFYING CONSUMERS AFFECTED BY A WATER SHUTDOWN DURING CONNECTIONS. THE CONTRACTOR WILL BE CHARGED THE ACTUAL COST.
 - THE CONTRACTOR SHALL PLACE THE DEPOSIT PRIOR TO SCHEDULING THE CONNECTION DATE.
 - CONNECTIONS SHALL BE SCHEDULED ON TUESDAYS THROUGH THURSDAYS. NO CONNECTIONS SHALL BE SCHEDULED ON MONDAYS, FRIDAYS, WEEKENDS, AND HOLIDAYS, OR FROM DECEMBER 18TH TO JANUARY 8TH OF EACH YEAR.
 - ALL MATERIALS SHALL BE ON HAND AND APPROVED BY THE ENGINEER PRIOR TO SCHEDULING THE CONNECTION DATE.
 - PUMPS USED TO DE-WATER THE CONNECTION AREA SHALL BE OPERATED IN THE PRESENCE OF THE ENGINEER PRIOR TO SCHEDULING THE CONNECTION DATE.
 - ALL CONNECTIONS SHALL BE PERFORMED IN THE PRESENCE OF THE ENGINEER.

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)		REVISION: _____ DATE: _____	DWF: _____ BY: _____ APPROVED: _____
DEPARTMENT OF WATER COUNTY OF KAUAI			
JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2 KĪLAUEA, KAUAI, HAWAII			
CONSTRUCTION NOTES - 1			
DESIGNED BY: AC	DRAWN BY: YN	CHECKED BY: GL	DATE: 3/11/19
APPROVED BY: <i>[Signature]</i> MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI			
SHEET 3 OF 60 SHEETS		G-002	

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WATER CONSTRUCTION NOTES - CONTINUED

16. IN ORDER TO PREVENT DAMAGE TO THE POLYETHYLENE ENCASUREMENT FROM EXCESSIVE HANDLING, THE POLYWRAP SHALL BE INSTALLED AROUND THE BARREL OF THE DUCTILE IRON PIPE AT ITS FINAL LOCATION ALONG THE TRENCHLINE. THE POLYETHYLENE ENCASED PIPE SHALL BE LIFTED USING A FABRIC TYPE SLING OR A SUITABLY PADDED CABLE OR CHAIN TO PREVENT DAMAGE TO THE POLYETHYLENE.
17. THE CONTRACTOR SHALL TAKE ALL NECESSARY COMPACTION TESTS WHILE THE WATERLINE TRENCH IS BEING BACKFILLED AND WHILE THE SUBBASE/ BASECOURSE IS BEING PLACED. IF THE TEST RESULTS INDICATE THAT ADDITIONAL COMPACTION IS REQUIRED, THE CORRECTIVE WORK SHALL BE COMPLETED BEFORE ANY ADDITIONAL TRENCH EXCAVATION OR PLACING OF SUBBASE/ BASECOURSE IS ALLOWED.

THE CONTRACTOR SHALL RETAIN THE SERVICES OF A REGISTERED GEOTECHNICAL ENGINEER FOR QUALITY CONTROL. THE COMPACTION TEST RESULTS SHALL BE CERTIFIED BY THE GEOTECHNICAL ENGINEER AND SUBMITTED TO THE DEPARTMENT OF WATER, STATE HIGHWAYS DIVISION (FOR WORK DONE WITHIN STATE R/W) AND THE DEPARTMENT OF PUBLIC WORKS (FOR WORK DONE WITHIN COUNTY R/W). THE GEOTECHNICAL ENGINEER SHALL CERTIFY THAT THE COMPACTION RESULTS MEET THE REQUIREMENTS OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
18. THE CONTRACTOR SHALL CONNECT ALL EXISTING CONSUMER PIPING TO THE NEW SERVICE LATERALS. THE DEPARTMENT OF WATER WILL TRANSFER THE EXISTING WATER METERS ONLY.
19. ALL FITTINGS SHALL BE MECHANICAL JOINT (MJ) AT EACH END UNLESS OTHERWISE NOTED. "MEGALUG" RETAINER GLANDS SHALL BE USED WITH ALL MECHANICAL JOINT FITTINGS AND VALVES USED IN CONNECTING NEW WATER MAINS TO EXISTING WATER MAINS UNLESS OTHERWISE NOTED.
20. ALL WATER VALVES THAT WILL BE ABANDONED IN PLACE SHALL BE PLACED IN THE "CLOSED" POSITION. REMOVE TOP SECTION OF VALVE BOX AND CONCRETE SETTLEMENT SLAB. FILL REMAINDER OF VALVE BOX WITH CONCRETE. PLACE BACKFILL AND REPAIR PAVEMENT SECTION TO APPLICABLE STATE OR COUNTY STANDARDS. BACKFILL TO FINISH GRADE IN ROAD SHOULDER AREA.
21. THE CONTRACTOR SHALL OBTAIN ALL APPLICABLE DEPARTMENT OF HEALTH PERMITS PRIOR TO THE START OF CONSTRUCTION. PERMITS INCLUDE, BUT ARE NOT LIMITED TO, NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS FOR STORM WATER, HYDROSTATIC TEST, DEWATERING, AND FOR CONSTRUCTION ACTIVITIES, INCLUDING CLEARING, GRADING, AND EXCAVATION, THAT RESULT IN THE DISTURBANCE OF EQUAL TO OR GREATER THAN ONE (1) ACRE OF TOTAL LAND AREA.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROPER DISPOSAL OF STORM WATER DISCHARGES AND EFFLUENT ASSOCIATED WITH CONSTRUCTION ACTIVITIES INCLUDING HYDROTASTING AND DISINFECTION OPERATIONS, TO SAFEGUARD PUBLIC HEALTH AND SAFETY IN ACCORDANCE WITH APPLICABLE DEPARTMENT OF HEALTH REQUIREMENTS. ALL PERMITS AND LICENSES FOR STORM WATER AND CONSTRUCTION WATER DISPOSAL, INCLUDING ALL APPLICATION, CHARGES, FEES, AND TAXES, ARE THE RESPONSIBILITY OF THE CONTRACTOR.
22. THE CONTRACTOR IS RESPONSIBLE FOR DEWATERING TRENCH AS NECESSARY WHERE GROUNDWATER IS ENCOUNTERED. ALL ASSOCIATED COSTS FOR DEWATERING SHALL BE BORNE BY THE CONTRACTOR.
23. THE USE OF KNOWN SEWER PUMP TRUCKS IS PROHIBITED FOR DOW PROJECTS FOR ANY USE, INCLUDING BUT NOT LIMITED TO DEWATERING AND TESTING OF NEW FACILITIES.
24. THE CONTRACTOR SHALL VERIFY OUTSIDE DIAMETER OF ALL EXISTING ASBESTOS-CEMENT (AC) WATERLINES TO BE CONNECTED. CONTRACTOR SHALL VERIFY USE OF PROPER GASKETS PRIOR TO CONNECTION. AC PIPE AND GASKET INFORMATION SHALL BE SUBMITTED TO ENGINEER FOR APPROVAL.
25. ALL REMOVAL, DISPOSAL AND CONNECTION WORK THAT INVOLVES ASBESTOS PIPE/MATERIAL SHALL BE DONE IN THE PRESENCE OF OR BY A LICENSED ASBESTOS CONTRACTOR.

THE LICENSED ASBESTOS CONTRACTOR SHALL SUBMIT THEIR PLAN FOR ALL ASSOCIATED REMOVED DISPOSAL AND CONNECTION WORK FOR THE PROJECT TO DOW FOR REVIEW AND APPROVAL PRIOR TO CONDUCTING THE WORK.
26. ALL CONNECTIONS TO EXISTING AC PIPE SHALL BE AT THE NEAREST AC PIPE JOINT. AC PIPE SHALL BE REMOVED BY ENTIRE LENGTH(S) TO FACILITATE THE CONNECTION. CUTTING OF AC PIPE IS PROHIBITED.
27. THE CONTRACTOR SHALL FOLLOW ALL APPLICABLE OSHA, HIOSH AND FEDERAL REGULATIONS IN HANDLING AND DISPOSAL OF ASBESTOS-CEMENT PIPE. DISPOSAL OF THE PIPE SHALL BE AT AN APPROVED ASBESTOS MATERIAL DISPOSAL SITE.
28. ALL WATERWORKS BRASS FITTINGS SHALL BE IN COMPLIANCE WITH THE AMENDED SECTION 1417 OF SAFE DRINKING WATER ACT (SDWA) WHICH TAKES EFFECT ON JANUARY 4, 2014. THE AMENDMENT INCLUDES A CHANGE TO THE DEFINITION OF "LEAD-FREE" BY REDUCING LEAD CONTENT FROM 8% TO A WEIGHTED AVERAGE OF NOT MORE THAN 0.25% IN THE WETTED SURFACE MATERIAL. ALL WATERWORKS BRASS FITTINGS INSTALLED FOR POTABLE WATER SERVICE ON JANUARY 4, 2014 AND BEYOND SHALL CONFORM TO THE AMENDED DEFINITION OF "LEAD-FREE."

- AS INDICATED IN SECTION 211 OF WATER SYSTEM STANDARDS - BRASS PRODUCTS, ALL BRASS FITTINGS SHALL CONFORM TO NSF STANDARD 61 AND SECTION 1417 OF THE SAFE DRINKING WATER ACT (SDWA). IN ADDITION, ALL BRASS FITTINGS SHALL CONFORM TO NSF STANDARD 372.
29. CONTRACTOR SHALL INSTALL WATER FACILITIES ONLY AFTER REACHING FINAL SUBGRADE OR HIGHER. THE DEPARTMENT OF WATER WILL NOT ALLOW INSTALLATION OF ANY WATER FACILITIES UNTIL THE FINAL SUBGRADE LAYER AT MINIMUM HAS BEEN ACHIEVED.
 30. PRIOR TO INSTALLATION OF NEW WATER LINES AND/OR FACILITIES, THE CONTRACTOR SHALL HAVE ALL FACILITIES SURVEYED AND STAKED OUT BY A LICENSED SURVEYOR AND THE CONTRACTOR SHALL EXPOSE, VERIFY, AND BACKFILL ALL EXISTING UNDERGROUND UTILITIES AND STRUCTURES IN CLOSE PROXIMITY TO CROSSINGS AND CONNECTIONS PRIOR TO EXCAVATION OF PIPELINE TRENCH. CONTRACTOR SHALL PROVIDE THE LICENSED SURVEYOR CUT SHEET AND THE PROBING INFORMATION TO THE DOW CONSTRUCTION ENGINEER FOR REVIEW AND APPROVAL BEFORE MOVING FORWARD WITH INSTALLATION VIA THE SUBMITTAL REVIEW PROCESS.
 31. THE DEPARTMENT SHALL BE PROVIDED TWENTY (20) WORKING DAYS FOR ALL SUBMITTAL REVIEWS FROM THE TIME OF SUBMISSION BY THE CONTRACTOR.

GRADING NOTES

GENERAL:

1. NO GRADING BETWEEN 7 P.M. TO 7 A.M. ON ANY GIVEN DAY OR ON SATURDAYS, SUNDAYS, AND HOLIDAYS WITHOUT WRITTEN PERMISSION FROM THE COUNTY ENGINEERS AND THE STATE DEPARTMENT OF HEALTH.
2. CONTRACTOR TO NOTIFY PUBLIC WORKS DEPARTMENT FIVE (5) BUSINESS DAYS PRIOR TO COMMENCING ANY GRADING WORK. WHEN COMPLETED AND READY FOR FINAL INSPECTION, NOTIFY PUBLIC WORKS DEPARTMENT INSPECTION SECTION.
3. ALL GRADING, GRUBBING, AND STOCKPILING WORK SHALL BE PERFORMED IN ACCORDANCE WITH COUNTY OF KAUAI ORDINANCE NO. 808.
4. THE LIMITS OF THE AREA TO BE GRADED SHALL BE FLAGGED BEFORE THE COMMENCEMENT OF THE GRADING WORK.
5. WHERE APPLICABLE AND FEASIBLE, THE MEASURES TO CONTROL EROSION, SEDIMENT, AND OTHER POLLUTANTS SHALL BE IN PLACE BEFORE ANY EARTH MOVING PHASE OF THE GRADING IS INITIATED.
6. TEMPORARY EROSION CONTROLS SHALL NOT BE REMOVED BEFORE PERMANENT EROSION CONTROLS ARE IN-PLACE AND ESTABLISHED.
7. TEMPORARY EROSION CONTROL PROCEDURES SHALL BE SUBMITTED FOR APPROVAL PRIOR TO APPLICATION FOR A GRADING PERMIT.
8. IF THE GRADING WORK INVOLVES CONTAMINATED SOIL, THEN ALL GRADING WORK SHALL BE DONE IN CONFORMANCE WITH APPLICABLE STATE AND FEDERAL REQUIREMENTS.
9. NON-COMPLIANCE TO ANY OF THE ABOVE REQUIREMENTS SHALL MEAN IMMEDIATE SUSPENSION OF ALL WORK, AND REMEDIAL WORK SHOULD COMMENCE IMMEDIATELY. ALL COSTS INCURRED SHALL BE BILLED TO THE PERMITTEE. FURTHERMORE, VIOLATORS SHALL BE SUBJECT TO ADMINISTRATIVE, CIVIL, AND/OR CRIMINAL PENALTIES.
10. A GRADING PERMIT IS NOT REQUIRED FOR THE PROJECT BUT A GRADING PERMIT MAY BE REQUIRED FOR THE DISPOSAL OF THE EXCESS EXCAVATED WASTED MATERIAL.
11. FOR EXCAVATED MATERIAL TO BE USED AS LANDFILL COVER MATERIAL, IT MUST BE FREE OF ORGANIC MATERIAL AND SHALL HAVE A MAXIMUM SIZE OF THREE INCHES. THE COUNTY SOLID WASTE DIVISION WILL NEED TO CONDUCT A SITE VISIT TO THE STOCKPILED MATERIAL BEFORE THE ACCEPTABLE MATERIAL CAN BE HAULED TO THE LANDFILL. IF THE EXCAVATED MATERIAL MEETS THE COVER MATERIAL CRITERIA, IT CAN BE ACCEPTED AT NO COST. MATERIAL NOT MEETING THE COVER MATERIAL CRITERIA CAN BE DISPOSED AT THE COUNTY LANDFILL WITH PAYMENT OF THE APPROPRIATE FEE.

TEMPORARY DUST CONTROL MEASURES:

1. THE GRADED OR PROJECT SITE THAT IS CLEARED OF VEGETATION SHALL BE KEPT DAMP WITH WATER CONTINUOUSLY FOR SEVEN (7) DAYS A WEEK. AT THE END OF EACH DAY, THE SITE SHALL BE SUFFICIENTLY DAMPENED WITH WATER ON A CONTINUAL BASIS SO THAT THE SITE WILL REMAIN MOISTENED DURING THE NIGHT.
2. THE CONTRACTOR SHALL CONDUCT HIS OPERATIONS SO THAT EXCAVATION, EMBANKMENT, AND IMPORTED MATERIAL SHALL BE DAMPENED WITH WATER ON A CONTINUAL BASIS TO PREVENT DUST PROBLEMS.
3. IN APPLYING FOR A GRADING PERMIT, THE CONTRACTOR SHALL SUBMIT PLANS, SCHEDULES AND/OR WRITTEN MEASURES WHICH PROVIDES FOR DUST CONTROL. THE DUST CONTROL MEASURES SHALL CONTAIN POSITIVE STATEMENTS WHICH REQUIRE ACTIONS OR WORK THAT PREVENT DUST PROBLEMS. NO PERMITS WILL BE ISSUED UNLESS THE COUNTY IS ASSURED THAT DUST AND EROSION PROBLEMS WILL BE MINIMIZED.

TEMPORARY EROSION CONTROL MEASURES:

1. TEMPORARY VEGETATIVE COVER SHALL BE PLANTED WITHIN A PERIOD OF 30 CALENDAR DAYS AFTER THE SITE HAS BEEN GRADED OR BARED OF VEGETATION OR IF THE SITE WILL BE SUSPENDED FOR MORE THAN 30 CALENDAR DAYS.
2. TEMPORARY VEGETATIVE COVER SHALL CONSIST OF 5 LBS. COMMON RYE GRASS SEED PER 1000 SF, 400 LBS. PER ACRE 10-30-10 OR EQUIVALENT FERTILIZER WORKED INTO THE SEED BED BEFORE PLANTING. TEMPORARY SPRINKLER SYSTEM IS TO BE INSTALLED CONCURRENTLY WITH ALL PLANTINGS. PLANTING AND MAINTENANCE OF GRASS SHALL CONFORM TO THE WATER SYSTEM STANDARDS, 2002 AS AMENDED.

PERMANENT EROSION CONTROL MEASURES:

1. THE CONTRACTOR SHALL GRASS AND RESTORE ALL AREAS EXPOSED AS RESULT OF CONSTRUCTION ACTIVITIES. THE GRASS SHALL BE PLANTED, FERTILIZED, AND MAINTAINED IN ACCORDANCE WITH THE WATER SYSTEM STANDARDS, 2002 AS AMENDED.
2. THE CONTRACTOR SHALL GRASS ALL EXPOSED AREAS THAT HAVE BEEN CONSTRUCTED TO FINAL GRADES WITHIN A PERIOD OF 30 CALENDAR DAYS.
3. IN LIEU OF GRASS SPRIGS, THE CONTRACTOR MAY USE HYDROMULCH SEEDING AND IRRIGATION SPRINKLER SYSTEM.

ENVIRONMENTAL CONTROL NOTES:


1. IN ACCORDANCE WITH CHAPTER 11-60.1, AIR POLLUTION CONTROL, TITLE 11, STATE ADMINISTRATIVE RULES, THE PROPERTY OWNER/DEVELOPER SHALL BE RESPONSIBLE FOR ENSURING THAT EFFECTIVE CONTROL MEASURES ARE PROVIDED TO MINIMIZE OR PREVENT ANY VISIBLE DUST EMISSION CAUSED BY THE CONSTRUCTION WORK FROM IMPACTING THE SURROUNDING AREAS INCLUDING THE OFF-SITE ROADWAYS USED TO ENTER/EXIT THE PROJECT. THESE MEASURES INCLUDE BUT NOT LIMITED TO THE USE OF WATER WAGONS, SPRINKLER SYSTEMS, DUST FENCES, ETC.
2. IN ACCORDANCE WITH CHAPTER 11-55, WATER POLLUTION CONTROL AND CHAPTER 11-54, WATER QUALITY STANDARDS, TITLE 11, STATE ADMINISTRATIVE RULES, THE PROPERTY OWNER/DEVELOPER SHALL BE RESPONSIBLE FOR ENSURING THAT THE BEST MANAGEMENT PRACTICE(BMP) TO MINIMIZE OR PREVENT THE DISCHARGE OF SEDIMENTS, DEBRIS AND OTHER WATER POLLUTANT INTO STATE WATERS ARE PROVIDED AT ALL TIMES.
3. IN ACCORDANCE WITH CHAPTER 11-58, SOLID WASTE MANAGEMENT CONTROL, TITLE 11, STATE ADMINISTRATIVE RULES, THE PROPERTY OWNER/DEVELOPER SHALL BE RESPONSIBLE FOR ENSURING THAT GRUB MATERIAL, DEMOLITION WASTE AND CONSTRUCTION WASTE GENERATED BY THE PROJECT ARE DISPOSED OF IN A MANNER OR AT A SITE APPROVED BY THE STATE DEPARTMENT OF HEALTH. DISPOSAL OF ANY OF THESE WASTES BY BURNING IS PROHIBITED.
4. IN ACCORDANCE WITH CHAPTER 11-46, COMMUNITY NOISE CONTROL, STATE ADMINISTRATIVE RULES, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING EFFECTIVE CONTROL MEASURES TO MINIMIZE OR PREVENT CONSTRUCTION RELATED NOISE FROM IMPACTING THE RESIDENTS IN THE IMMEDIATE AREA. IF REQUIRED, NOISE REDUCTION MEASURES SHALL BE IMPLEMENTED BY THE CONTRACTOR DURING THE CONSTRUCTION WORK.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL APPLICABLE PERMITS FROM THE DEPARTMENT OF HEALTH INCLUDING BUT NOT LIMITED TO NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES), NOTICE OF INTENT AND GENERAL PERMIT FOR STORM WATER, HYDROSTATIC TEST AND DEWATERING DISCHARGES PRIOR TO COMMENCING CONSTRUCTION. NPDES PERMIT SHALL BE REQUIRED PRIOR TO GRADING OR GRUBBING WORK OVER AN AREA OF ONE ACRE OR MORE.
6. AFTER EACH RAINFALL EVENT, THE CONTRACTOR SHALL REMOVE ALL SILT AND DEBRIS RESULTING FROM THIS WORK AND DEPOSITED IN DRAINAGE FACILITIES, ROADWAYS AND OTHER AREAS. THE COST INCURRED FOR ANY NECESSARY REMEDIAL ACTION BY THE DEPARTMENT OF WATER SHALL BE PAYABLE BY THE CONTRACTOR.
7. BEST MANAGEMENT PRACTICE (BMP) SHALL BE EMPLOYED AT ALL TIMES TO THE MAXIMUM EXTENT PRACTICABLE PREVENT DAMAGE BY SEDIMENTATION, EROSION OR DUST TO STREAMS, WATERCOURSES, NATURAL AREAS AND THE PROPERTY OF OTHERS.
8. THE CONTRACTOR SHALL OBTAIN AND COMPLY WITH NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEMS (NPDES) PERMIT REQUIREMENTS FOR ALL PROJECTS WHICH WILL DISTURB ONE (1) ACRE OR MORE LAND. THE CONTRACTOR SHALL NOT START CONSTRUCTION UNTIL NOTICE OF GENERAL PERMIT COVERAGE (NGPC) IS RECEIVED FROM THE DEPARTMENT OF HEALTH, STATE OF HAWAII AND HAS SATISFIED ANY OTHER APPLICABLE REQUIREMENTS OF THE NPDES PERMIT PROGRAM.
9. THE PROPERTY MAY HARBOR RODENTS WHICH WILL BE DISPERSED TO THE SURROUNDING AREAS WHEN THE SITE IS CLEARED. IN ACCORDANCE WITH CHAPTER 11-26, ENTITLED VECTOR CONTROL OF TITLE 11, HAR, THE APPLICANT SHALL ASCERTAIN THE PRESENCE OR ABSENCE OF RODENTS ON THE PROPERTY. SHOULD THE PRESENCE OF RODENTS BE DETERMINED, THE APPLICANT SHALL ERADICATE THE RODENTS PRIOR TO CLEARING THE SITE.
10. A COPY OF THE PLANS, CONSTRUCTION SCHEDULE AND/OR WRITTEN MEASURES THAT IS REQUIRED TO BE SUBMITTED BY THE CONTRACTOR (DUST CONTROL MEASURES/PLANS) SHOULD ALSO BE SENT TO THE DEPARTMENT OF HEALTH FOR MONITORING PURPOSES.



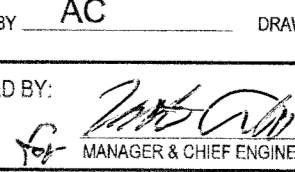
KAUAI ISLAND UTILITY COOPERATIVE NOTES

1. THE CONTRACTOR SHALL MAINTAIN A MINIMUM WORKING CLEARANCE OF TEN FEET FROM EXISTING OVERHEAD LINES.
2. THE GENERAL CONTRACTOR SHALL SUBMIT A WORK SCHEDULE TO KIUC SERVICE ASSURANCE ENGINEERING SECTION AND INCLUDE THE FOLLOWING:
 - a. POINT OF CONTACT (POC) AT THE PROJECT SITE TO INCLUDE:
 - OFFICE TELEPHONE NUMBER
 - CELLULAR NUMBER AND PAGER NUMBERS
3. PRIOR TO EXCAVATION THE CONTRACTOR WILL CONTACT THE UNDERGROUND SERVICE ALERT AT 1-808-227-2600, TO LOCATE UNDERGROUND PRIMARY, SECONDARY AND SERVICES IN THE AFFECTED AREA.
4. THE CONTRACTOR SHALL NOTIFY KIUC CONSTRUCTION COORDINATOR/INSPECTOR AT (808)246-2326 PRIOR TO START OF WORK TO ANY TRENCH EXCAVATION THAT CROSSES OR IS ADJACENT TO EXISTING CONDUITS AND FACILITIES.
5. A MINIMUM OF 36" HORIZONTAL SEPARATION SHALL BE MAINTAINED BETWEEN KIUC EXISTING DIRECT BURIED CONDUITS AND THE PROPOSED WATERLINE AND LATERALS. A MINIMUM OF 12" VERTICAL SEPARATION WITH 3" CONCRETE ENCASUREMENT AROUND THE EXISTING KIUC CONDUIT AND 12" ON BOTH SIDES OF THE CROSSING.
6. DAMAGES TO KIUC UNDERGROUND FACILITIES SHALL BE REPORTED IMMEDIATELY TO KIUC TROUBLE CALL DESK AT (808) 246-8200.
7. THE CONTRACTOR SHALL PAY FOR TEMPORARY SUPPORTS AND BRACING FOR ALL POWER POLES THAT MAY BE AFFECTED BY THE TRENCH EXCAVATION AS REQUIRED BY KIUC. THE WORK WILL BE PERFORMED BY KIUC PERSONNEL FOR THE SUPPORT AND BRACING OF THE UTILITY POLES AND LINES SHALL BE INCIDENTAL TO THE WATERLINE CONSTRUCTION. THE COST FOR SUPPORTING AND BRACING POLES AND LINES SHALL BE INCIDENTAL TO THE WATERLINE CONSTRUCTION.
8. ALL TRENCHES MUST BE INSPECTED BY KIUC PRIOR TO BACKFILLING AND CONCRETE ENCASING OPERATION.

SURVEY NOTES

1. BENCHMARK SHOWN ON C-101.

"KILAUEA"  : MAG NAIL
ELEV = 387.81 MSL
X = 8,803.53
Y = 11,602.45
2. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION TO PRESERVE BENCHMARKS (SURVEY MONUMENTS) WHENEVER THE CENTER OF A SURVEY MONUMENT IS LESS THAN THREE (3) FEET FROM THE EDGE OF CONSTRUCTION. THE CONTRACTOR SHALL RETAIN A LICENSED SURVEYOR TO REFERENCE THE LOCATION OF SAID SURVEY MONUMENT.
3. BENCHMARKS THAT ARE DISTURBED OR DESTROYED SHALL BE RESTORED UNDER A LICENSED LAND SURVEYOR'S DIRECTION. COPIES OF FIELD NOTES, DESCRIPTIONS AND NEW VALUES OF THE NEW BENCHMARK SHALL BE SENT TO THE DEPARTMENT OF PUBLIC WORKS SURVEY SECTION FOR REVIEW AND APPROVAL PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)			
 <p>LICENSED PROFESSIONAL ENGINEER No. 10335-C HAWAII, U.S.A.</p>		DEPARTMENT OF WATER COUNTY OF KAUAI JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII	
		CONSTRUCTION NOTES - 2 DESIGNED BY AC DRAWN BY YN CHECKED BY GL APPROVED BY  DATE 3/11/19 MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI	
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.")		SHEET 4 OF 60 SHEETS G-003 EXP DATE 4/30/20	

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PUBLIC HEALTH, SAFETY, AND CONVENIENCE NOTES

1. THE CONTRACTOR SHALL OBSERVE AND COMPLY WITH ALL FEDERAL, STATE, AND LOCAL LAWS REQUIRED FOR THE PROTECTION OF PUBLIC HEALTH AND SAFETY AND ENVIRONMENTAL QUALITY.
2. THE CONTRACTOR, AT HIS OWN EXPENSE, SHALL KEEP THE PROJECT AREA AND SURROUNDING AREA FREE FROM DUST NUISANCE. THE WORK SHALL BE IN CONFORMANCE WITH THE AIR POLLUTION CONTROL STANDARDS AND REGULATIONS OF THE STATE DEPARTMENT OF HEALTH.
3. NO CONTRACTOR SHALL PERFORM ANY GRADING AND TRENCHING OPERATION SO AS TO CAUSE FALLING ROCKS, SOIL OR DEBRIS IN ANY FORM TO FALL, SLIDE OR FLOW ONTO ADJOINING PROPERTIES, STREETS OR NATURAL WATERCOURSES. SHOULD SUCH VIOLATION OCCUR, THE COSTS INCURRED FOR ANY REMEDIAL ACTION BY THE DOW SHALL BE PAYABLE BY THE CONTRACTOR.
4. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION, CONVENIENCE AND SAFETY OF THE PUBLIC.

NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENTS

1. AS NEEDED, THE CONTRACTOR SHALL APPLY FOR, OBTAIN AND COMPLY WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENTS FOR KAUA'I DISTRICT PERMIT PROJECTS. THIS IS AVAILABLE AT THE KAUA'I DISTRICT OFFICE AT 3040 UMI STREET. DUE TO POTENTIAL COST IMPACTS, THE CONTRACTOR NEEDS TO BE AWARE OF THESE REQUIREMENTS.

HISTORICAL PRESERVATION NOTES

1. SHOULD HISTORIC REMAINS SUCH AS ARTIFACTS, BURIALS, CONCENTRATION OF SHELL OR CHARCOAL BE ENCOUNTERED DURING CONSTRUCTION ACTIVITIES, WORK SHALL CEASE IMMEDIATELY OF THE IMMEDIATE VICINITY OF THE FIND AND THE FIND SHALL BE PROTECTED FROM FURTHER DAMAGE. THE CONTRACTOR SHALL CORDON OFF THE AREA AND IMMEDIATELY NOTIFY THE PLANNING DEPARTMENT AT (808) 241-4050 AND THE STATE HISTORIC PRESERVATION DIVISION AT (808) 692-8015, WHICH WILL ASSESS THE SIGNIFICANCE OF THE FIND AND RECOMMEND THE APPROPRIATE MITIGATION MEASURES IF NECESSARY. IN ADDITION, IF HUMAN BURIALS ARE FOUND, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE COUNTY OF KAUA'I POLICE DEPARTMENT.

DISABILITY AND COMMUNICATION ACCESS BOARD (DCAB) NOTE

1. THIS PROJECT SHALL MEET THE ACCESSIBILITY REQUIREMENT OF HAWAII REVISD STATUTES (HRS) 103-50, US DEPARTMENT OF JUSTICE'S "2010 STANDARDS FOR ACCESSIBLE DESIGN" AND 2004 AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG) SECTIONS 4.1-4.3, ALL AS AMENDED.

KAUA'I FIRE DEPARTMENT NOTES

CONTRACTOR SHALL PROVIDE FIRE PROTECTION IN CONGRUENCE WITH THE FOLLOWING CONSENSUS STANDARDS PROMOTED BY THIS AHJ (KFD FIRE):

- 1) NFPA 1, 2012 EDITION
- 2) NFPA 10, 2010 EDITION (PORTABLE EXTINGUISHERS)
- 4) NFPA 54, 2012 EDITION (NATIONAL FUEL GAS CODE)
- 5) NFPA 70, 2011 EDITION (NATIONAL ELECTRICAL CODE)
- 7) NFPA 101, 2012 EDITION (LIFE SAFETY CODE)
- 8) HAWAII REVISD STATUTES (HRS) SECTION 132
- 9) KAUA'I COUNTY CODE (1987) CHAPTER 15A
- 10) KAUA'I COUNTY CODE CHAPTER 15A CODE AMENDMENTS (JANUARY 25, 2012)

SPECIFICALLY, CONTRACTOR SHALL FOLLOW THESE PROVISIONS OF NFPA 1 (2012):

- 1) 10.15.10.4 FIRE EXTINGUISHERS. A MINIMUM OF ONE PORTABLE FIRE EXTINGUISHER WITH A RATING OF NOT LESS THAN 2-A:10-B:C SHALL BE PROVIDED;
- 2) 13.6.1 GENERAL REQUIREMENTS. THE SELECTION, INSTALLATION, DISTRIBUTION, INSPECTION, MAINTENANCE, AND TESTING OF PORTABLE FIRE EXTINGUISHERS SHALL BE IN ACCORDANCE WITH NFPA 10 AND SECTION 13.6.

AHJ RESERVES RIGHT TO APPROVE/DENY CERTIFICATE OF OCCUPANCY BASED UPON FURTHER REVIEW OF SUBMITTED SHOP DRAWINGS FOR ABOVE-MENTIONED FIRE PROTECTION SYSTEMS.

SYMBOLS

○	BOLLARD
	DEMOLISHED AND/OR REMOVED ITEM
	APPROXIMATE DIRECTION OF ASSUMED SURFACE RUNOFF DRAINAGE FLOW
	CENTERLINE OF NEW AC PAVEMENT SWALE
	SILT FENCE
	APPROXIMATE CONSTRUCTION INGRESS/EGRESS
	CONTRACTOR STAGING AREA
	ROOF OVERHANG
	LIMIT OF PROJECT CONSTRUCTION, APPROXIMATE LIMIT OF GRADING
	TOP OF GRASS BANK
	EXISTING CONTOUR LINE
	NEW CONTOUR LINE
	PROJECT LINE
	CONCRETE CURB
	CONCRETE HEADER

ABBREVIATIONS

AC, A.C.	ASPHALTIC CONCRETE, ASBESTOS CONCRETE	K	CURVE COEFFICIENT
AD	ALGEBRAIC DIFFERENCE	KIUC	KAUA'I ISLAND UTILITY COOPERATIVE
ADA	AMERICANS WITH DISABILITIES ACT	KV	KILOVOLT
ADT	AZIMUTH, DISTANCE, TRAVERSE	L	LENGTH
AHJ	AUTHORITY HAVING JURISDICTION	LAT	LATERAL
APPROX	APPROXIMATE	LB(S)	POUND(S)
ARV	AIR RELEASE VALVE	LF	LINEAR FEET
ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS	LOC	LOCATION
ATB	ASPHALT TREATED BASE	LP	LOW POINT
AVE	AVENUE	MAX	MAXIMUM
B	BOTTOM	MB	MAIL BOX
BC	BOTTOM CURB	MFR	MANUFACTURER
BLDG	BASELINE	MG	MILLION GALLON
BLK(S)	BUILDING	MH	MILLION GALLON
BMP(S)	BLOCK(S)	MIN	MINIMUM
BV	BEST MANAGEMENT PRACTICE(S)	MJ	MECHANICAL JOINT
BVCE	BOTTOM VERTICAL	MN	METER NUMBER
BVCS	BEGIN VERTICAL CURVE ELEVATION	MON	MONUMENT
BW	BEGIN VERTICAL CURVE STATION	MSS	MANUFACTURERS STANDARDIZATION SOCIETY
	BOTTOM WALL	MTR	METER
		MULT	MULTIPLE
CATV	CABLE TELEVISION	NA	NORTH
CB	CATCH BASIN	NP	NOT APPLICABLE
CCP	CONCRETE CYLINDER PIPE	ND	NOMINAL DIAMETER
CI	CAST IRON	NO(S)	NUMBER(S)
CJ	CONSTRUCTION JOINT	NPDES	NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM
CKPL	CHECKERED PLATE	NPT	NATIONAL PIPE THREAD TAPER
CL	CENTERLINE	OC	ON CENTER
CL2	CLASS	OCEW	ON CENTER EACH WAY
CLF	CHLORINE	OD	OUTSIDE DIAMETER
CLR	CHAIN LIKE FENCE	OH/E	OVERHEAD ELECTRICAL
CLSM	CLEARANCE	O/S	OFFSET
CO	CONTROLLED LOW STRENGTH MATERIAL	OSHA	OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION
COCO	CLEANOUT	PAVT, PVT	PAVEMENT
CONC	COCONUT	PC	POINT OF CURVATURE
CONN	CONCRETE	PE	PLAIN END, POLYETHYLENE
CONST	CONNECT, CONNECTION	PERF	PERFORATED
CONT	CONSTRUCT	PI	POINT OF INTERSECTION
CORP	CONTINUE, CONTINUATION	PL	PROPERTY LINE, PLATE
COV	CORPORATION	PL	PLACE
CMU	COVER	PREM-ID	PREMISE IDENTIFICATION
CRF	CONCRETE MASONRY UNIT	PSI	POUND PER SQUARE INCH
CRM	CONCRETE RUBBLE MASONRY	PT	POINT OF TANGENCY
CU	COPPER	PVC	POLYVINYL CHLORIDE
		PVI	POINT OF VERTICAL INTERSECTION
D	DRAIN, DIAMETER	Q	RATE OF FLOW
DEFL	DEFLECTION	R	RADIUS
DEPT	DEPARTMENT	RCP	REINFORCED CONCRETE PIPE
DET	DETAIL	RD	ROAD
DI	DUCTILE IRON	RECON	RECONNECT, RECONNECTION
DIA	DIAMETER	REF	REFERENCE
DIP	DUCTILE IRON PIPE	REINF	REINFORCED
DL	DRAIN LINE	REQ'D	REQUIRED
DMH	DRAIN MANHOLE	RFG	RESTRAINING FLANGE/ GLAND
DOW	DEPARTMENT OF WATER, COUNTY OF KAUA'I	RTU	REMOTE TERMINAL UNIT
DPW	DEPARTMENT OF PUBLIC WORKS	R/W	RIGHT-OF-WAY
DRW	DRIVEWAY	S	SEWER, SLOPE, SOUTH OR SPREAD
DWG(S)	DRAWING(S)	SCH	SCHEDULE
DW, DOW	DEPARTMENT OF WATER	SE	SCREWED END
E	EAST, EDGE	SERV	SERVICE
EF	EACH FACE	SF	SQUARE FOOT/FEET
EG	EXISTING GRADE	SHT	SHEET
ELEC	ELECTRICAL	SMH	SEWER MANHOLE
ELEV	ELEVATION	S.S.	STAINLESS STEEL
EOH	ELECTRICAL, OVERHEAD	SSPC	STEEL STRUCTURES PAINTING
EP	ELECTRICAL POLE	ST	STREET
ES	EACH SIDE	STA	STATION
ESW	EDGE OF SIDEWALK	STD	STANDARD
ETC	ETCETERA	STL	STEEL
EVC	END VERTICAL CURVE	STRUCT	STRUCTURAL
EVCE	END VERTICAL CURVE ELEVATION		
EVCS	END VERTICAL CURVE STATION		
EW	EACH WAY		
EXIST	EXISTING		
FD	FOUND		
FE	FLANGED END		
FF	FINISHED FLOOR		
FG	FINISHED GRADE		
FH	FIRE HYDRANT		
FIN	FINISHED		
FL, F	FLANGED		
FLR	FLOOR		
FT	FEET		
FTG	FOOTING		
GALV, GA	GALVANIZED		
GASCO	THE GAS COMPANY		
GI	GALVANIZED IRON		
GV	GATE VALVE		
H, HT	HEIGHT		
HB	HOSE BIBB		
HIOSH	HAWAII OCCUPATIONAL SAFETY AND HEALTH		
HORIZ	HORIZONTAL		
HP	HIGH POINT		
HTCO	HAWAIIAN TELCOM		
ID	IDENTIFICATION		
INC	INCORPORATION		
INCL	INCLUDING		
INV	INVERT		
IPT	INTERNAL PIPE THREAD		
JK	JACKET		
JKT	JOINT		

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LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)		REVISION DATE BY APPROVED	
		DEPARTMENT OF WATER COUNTY OF KAUA'I JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUA'I, HAWAII	
		MISCELLANEOUS NOTES, ABBREVIATIONS, AND SYMBOLS DESIGNED BY <u>AC</u> DRAWN BY <u>YN</u> CHECKED BY <u>GL</u> APPROVED BY: <u>3/11/19</u> <small>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUA'I</small>	
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.")		SHEET 5 OF 60 SHEETS G-004	

WATER POLLUTION AND EROSION CONTROL NOTES

GENERAL:

- THESE NOTES ARE INTENDED TO AMEND AND SUPPLEMENT ANY REQUIREMENTS AND PROVISIONS OF THE WATER QUALITY AND WATER POLLUTION CONTROL STANDARDS CONTAINED IN HAWAII ADMINISTRATIVE RULES, TITLE 11, CHAPTER 54 "WATER QUALITY STANDARDS," AND TITLE 11, CHAPTER 55, "WATER POLLUTION CONTROL," STORM WATER RUNOFF SYSTEM MANUAL (JULY 2001 AS AMENDED) OF THE DEPARTMENT OF PUBLIC WORKS, COUNTY OF KAUAI; AND, ANY NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMITS COVERING THE PROJECT. THE CONTRACTOR SHALL COMPLY WITH THE REQUIREMENTS OF THESE PLANS, GUIDELINES AND PERMITS. WHERE REQUIREMENTS ARE IN CONFLICT, THE MORE STRINGENT REQUIREMENT SHALL BE IMPLEMENTED.
- THE CONTRACTOR IS REMINDED OF THE REQUIREMENTS OF SECTION 209 - WATER POLLUTION AND EROSION CONTROL AND SECTION 620 - DUST CONTROL IN THE "HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION 2005," AND ITS AMENDMENTS. SECTION 209 DESCRIBES BUT IS NOT LIMITED TO SUBMITTAL REQUIREMENTS; SCHEDULING OF A WATER POLLUTION AND EROSION CONTROL CONFERENCE WITH THE COUNTY; CONSTRUCTION REQUIREMENTS; METHOD OF MEASUREMENT; AND BASIS OF PAYMENT. NO WORK SHALL COMMENCE WITHOUT A BMP PLAN APPROVED BY THE DEPARTMENT OF HEALTH.
- THE BEST MANAGEMENT PRACTICES (BMPs) SHOWN IN PLANS ARE THE MINIMUM REQUIRED AND ARE SELECTED BASED ON ANTICIPATED MEANS AND METHODS. THE CONTRACTOR SHALL DEVELOP A SITE-SPECIFIC BMP PLAN BY MODIFYING AND AMENDING THESE PLANS AS NECESSARY TO ACCOMMODATE THE SPECIFIC MEANS AND METHODS USED, AND COMPLY WITH THE AMENDMENT NOTIFICATION REQUIREMENTS OF THE NPDES PERMITS (IF ANY AND APPLICABLE).
- THE CONTRACTOR SHALL KEEP A COPY OF THE APPROVED BMP PLAN, NOI, ETC. ON THE PROJECT SITE. THE BMP PLAN SHALL BE UPDATED TO REFLECT ANY CHANGES MADE DURING THE COURSE OF CONSTRUCTION FOR THE DURATION OF THE PROJECT.
- WHERE SUFFICIENT DETAIL REGARDING INSTALLATION, CONDUCTING THE WORK, AND/OR MAINTENANCE OF BMPs IS NOT INCLUDED IN THESE PLANS, THE CONTRACTOR SHALL REFER TO THE "BEST MANAGEMENT PRACTICE PRACTICES (BMPs) FOR SEDIMENT AND EROSION CONTROL" (FEBRUARY 2011 AS AMENDED) OF THE DEPARTMENT OF PUBLIC WORKS, COUNTY OF KAUAI.
- THE ENGINEER MAY ASSESS LIQUIDATED DAMAGES OF UP TO \$27,500 FOR NON-COMPLIANCE OF EACH BMP REQUIREMENT AND EACH REQUIREMENT STATED IN SECTION 209, FOR EVERY DAY ON NON-COMPLIANCE. THERE IS NO MAXIMUM LIMIT ON THE AMOUNT ASSESSED PER DAY.
- THE ENGINEER WILL DEDUCT THE COST FROM THE PROGRESS PAYMENT FOR ALL CITATIONS RECEIVED BY THE DEPARTMENT FOR NON-COMPLIANCE, OR THE CONTRACTOR/OWNER SHALL REIMBURSE THE STATE AND/OR COUNTY FOR THE FULL AMOUNT OF THE OUTSTANDING COST INCURRED BY THE STATE AND/OR COUNTY.
- BMPs SHALL BE EMPLOYED AT ALL TIMES DURING CONSTRUCTION TO THE MAXIMUM EXTENT PRACTICABLE TO PREVENT DAMAGE BY SEDIMENTATION TO ANY STREAMS, WATERCOURSES, NATURAL AREAS AND THE PROPERTY OF OTHERS.
- IF THE CONTRACTOR IS NOT ABLE TO SATISFACTORILY CONTROL EROSION, SEDIMENT AND DUST NOISANCE EMISSION FROM THE PROJECT SITE, ALL CONSTRUCTION WORK SHALL CEASE EXCEPT FOR WATERING AND OTHER STABILIZATION EFFORTS.
- CONSTRUCTION SHALL BE SEQUENCED TO MINIMIZE THE EXPOSURE TIME OF CLEARED SURFACE AREA. THE FIRST CONSTRUCTION SECTION SHALL BE STABILIZED BEFORE THE NEXT SECTION SHALL BEGIN. STABILIZATION SHALL BE ACCOMPLISHED BY TEMPORARILY OR PERMANENTLY PROTECTING THE DISTURBED SOIL SURFACE FROM RAINFALL IMPACT AND RUNOFF.
- THE CONTRACTOR SHALL PROVIDE ADDITIONAL EROSION, SEDIMENT AND DUST CONTROL STRUCTURES AS NEEDED WHERE CONTRACTOR TRAVELS OR WORKS BEYOND THE LIMITS OF CONSTRUCTION INDICATED ON THESE PLANS.

WASTE DISPOSAL:

- WASTE MATERIALS:** ALL WASTE MATERIALS SHALL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER THAT DOES NOT LEAK. THE DUMPSTER SHALL MEET ALL LOCAL AND STATE SOLID WASTE MANAGEMENT REGULATIONS. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE SHALL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER SHALL BE EMPTIED AT A MINIMUM OF TWICE PER WEEK OR AS OFTEN AS IS DEEMED NECESSARY. NO CONSTRUCTION WASTE MATERIAL SHALL BE BURIED ONSITE. THE CONTRACTOR'S SUPERVISORY PERSONNEL SHALL BE INSTRUCTED REGARDING THE CORRECT PROCEDURE FOR WASTE DISPOSAL. NOTICES STATING THESE PRACTICES SHALL BE POSTED IN THE OFFICE TRAILER AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR SEEING THAT THESE PROCEDURES ARE FOLLOWED.
- HAZARDOUS WASTE:** ALL HAZARDOUS WASTE MATERIALS SHALL BE DISPOSED OF IN THE MANNER SPECIFIED BY LOCAL OR STATE REGULATIONS OR BY THE MANUFACTURER. THE CONTRACTOR'S SITE PERSONNEL SHALL BE INSTRUCTED IN THESE PRACTICES AND SHALL BE RESPONSIBLE FOR SEEING THAT THESE PRACTICES ARE FOLLOWED.
- SANITARY WASTE:** ALL SANITARY WASTE SHALL BE COLLECTED FROM THE PORTABLE NITS A MINIMUM OF ONCE PER WEEK, OR AS REQUIRED.

EROSION AND SEDIMENT CONTROL INSPECTION AND MAINTENANCE PRACTICES:

- ALL CONTROL MEASURES SHALL BE INSPECTED AT LEAST ONCE EACH WEEK AND WITHIN 24 HOURS FOLLOWING ANY RAINFALL EVENT OF 0.5 INCHES OR GREATER.
- ALL MEASURES SHALL BE MAINTAINED IN GOOD WORKING ORDER. IF REPAIR IS NECESSARY, IT SHALL BE INITIATED WITHIN 24 HOURS AFTER THE INSPECTION.
- IF HEAVY RAINS ARE PROJECTED DURING A WORKDAY, ALL BMPs THAT ARE A PART OF THIS PROJECT SHALL BE INSPECTED IMMEDIATELY AND REINFORCED AS NECESSARY.
- BUILT UP SEDIMENT SHALL BE REMOVED FROM SILT FENCE WHEN IT HAS REACHED ONE-THIRD THE HEIGHT OF THE FENCE.
- SILT SCREEN OR FENCE SHALL BE INSPECTED FOR DEPTH OF SEDIMENT, TEARS, TO VERIFY THAT THE FABRIC IS SECURELY ATTACHED TO THE FENCE POSTS OR CONCRETE SLAB AND TO VERIFY THAT THE FENCE POSTS ARE FIRMLY IN THE GROUND.
- TEMPORARY AND PERMANENT SEEDING AND PLANTING SHALL BE INSPECTED FOR BARE SPOTS, WASH OUTS AND HEALTHY GROWTH.
- THE CONTRACTOR SHALL SUBMIT TO THE COUNTY A MAINTENANCE INSPECTION REPORT PROMPTLY AFTER EACH WEEKLY INSPECTION.

- THE CONTRACTOR SHALL SELECT A MINIMUM OF THREE PERSONNEL WHO SHALL BE RESPONSIBLE FOR INSPECTION, MAINTENANCE AND REPAIR ACTIVITIES AND FILLING OUT THE INSPECTION AND MAINTENANCE REPORT.
- PERSONNEL SELECTED FOR THE INSPECTION AND MAINTENANCE RESPONSIBILITIES SHALL RECEIVE TRAINING FROM THE CONTRACTOR. THEY SHALL BE TRAINED IN ALL THE INSPECTION AND MAINTENANCE PRACTICES NECESSARY FOR KEEPING THE EROSION AND SEDIMENT CONTROLS USED ONSITE IN GOOD WORKING ORDER.
- ALL SLOPES AND EXPOSED AREAS SHALL BE GRASSED AS FINAL GRADES HAVE BEEN ESTABLISHED. GRADING TO FINAL GRADE SHALL BE CONTINUOUS, AND ANY AREA IN WHICH WORK HAS BEEN INTERRUPTED OR DELAYED OR EXPOSED FOR MORE THAN 15 DAYS SHALL BE GRASSED IN ORDER TO PREVENT DUST EMISSION, EROSION AND SILT RUNOFF. AREAS WITH IMPORTED SOILS SHALL BE GRASSED NOT MORE THAN 5 WORKING DAYS AFTER THE FINAL GRADES HAVE BEEN ESTABLISHED.

TEMPORARY EROSION CONTROL SHALL NOT BE REMOVED BEFORE PERMANENT EROSION CONTROLS ARE IN-PLACE AND ESTABLISHED.

GOOD HOUSEKEEPING BEST MANAGEMENT PRACTICES:

- MATERIALS POLLUTION PREVENTION PLAN:**
 - APPLICABLE MATERIALS OR SUBSTANCES LISTED BELOW ARE EXPECTED TO BE PRESENT ONSITE DURING CONSTRUCTION. OTHER MATERIALS AND SUBSTANCES NOT LISTED BELOW SHALL BE ADDED TO THE INVENTORY OF THE CONSTRUCTION CONTRACTOR'S SITE-SPECIFIC BMP PLAN.

CONCRETE	FERTILIZERS
DETERGENTS	PETROLEUM BASED PRODUCTS
PAINTS (ENAMEL AND LATEX)	CLEANING SOLVENTS
METAL STUDS	WOOD
TAR	MASONRY BLOCK
 - MATERIAL MANAGEMENT PRACTICES SHALL BE USED TO REDUCE THE RISK OF SPILLS OR OTHER ACCIDENTAL EXPOSURE OF MATERIALS AND SUBSTANCES TO STORM WATER RUNOFF. AN EFFORT SHALL BE MADE TO STORE ONLY ENOUGH PRODUCTS AS IS REQUIRED TO DO THE JOB.
 - ALL MATERIALS STORED ONSITE SHALL BE STORED IN A NEAT, ORDERLY MANNER IN THEIR APPROPRIATE CONTAINERS AND IF POSSIBLE UNDER A ROOF OR OTHER ENCLOSURE.
 - PRODUCTS SHALL BE KEPT IN THEIR ORIGINAL CONTAINERS WITH THE ORIGINAL MANUFACTURER'S LABEL.
 - SUBSTANCES SHALL NOT BE MIXED WITH ONE ANOTHER UNLESS RECOMMENDED BY THE MANUFACTURER.
 - A PRODUCT SHALL BE USED UP COMPLETELY BEFORE DISPOSING OF THE CONTAINER.
 - MANUFACTURER'S RECOMMENDATIONS FOR PROPER USE AND DISPOSAL SHALL BE FOLLOWED.
 - THE CONTRACTOR SHALL CONDUCT A DAILY INSPECTION TO ENSURE PROPER USE AND DISPOSAL OF MATERIALS ONSITE.
- HAZARDOUS MATERIAL POLLUTION PREVENTION PLAN:**
 - PRODUCTS SHALL BE KEPT IN ORIGINAL CONTAINERS UNLESS THEY ARE NOT RESEALABLE.
 - ORIGINAL LABELS AND MATERIAL SAFETY DATA SHEETS (MSDS) SHALL BE RETAINED AND MADE AVAILABLE TO THE COUNTY UPON REQUEST.
 - SURPLUS PRODUCTS SHALL BE DISPOSED OF ACCORDING TO MANUFACTURER'S INSTRUCTIONS OR LOCAL AND STATE RECOMMENDED REGULATIONS.

ON-SITE AND OFF-SITE PRODUCTS SPECIFIC PRACTICES:

- THE FOLLOWING PRODUCTS SPECIFIC PRACTICES SHALL BE FOLLOWED ONSITE:
- PETROLEUM BASED PRODUCTS:** ALL ONSITE VEHICLES SHALL BE MONITORED FOR LEAKS AND RECEIVED REGULAR PREVENTIVE MAINTENANCE TO REDUCE THE CHANCE OF LEAKAGE. PETROLEUM PRODUCTS SHALL BE STORED IN TIGHTLY SEALED CONTAINERS WHICH ARE CLEARLY LABELED. ANY ASPHALT SUBSTANCES USED ONSITE SHALL BE APPLIED ACCORDING TO THE MANUFACTURER'S RECOMMENDATION.
 - FERTILIZERS:** APPLY FERTILIZERS USED ONLY IN THE MINIMUM AMOUNTS RECOMMENDED BY THE MANUFACTURER. ONCE APPLIED, WORK FERTILIZER INTO THE SOIL TO LIMIT EXPOSURE TO STORM WATER. STORAGE SHALL BE KEPT IN A COVERED TRANSFER THE CONTENTS OF ANY PARTIALLY USED BAGS OF FERTILIZER TO A SEALABLE PLASTIC BIN TO AVOID SPILLS.
 - PAINTS:** SEAL AND STORE ALL CONTAINERS WHEN NOT REQUIRED FOR USE. DO NOT DISCHARGE EXCESS PAINT TO THE ROADWAY DRAINAGE SYSTEM. DISPOSE PROPERLY ACCORDING TO THE MANUFACTURER'S INSTRUCTION OR STATE AND LOCAL REGULATIONS.
 - CONCRETE TRUCKS:** WASH OUT OR DISCHARGE CONCRETE TRUCK DRUM WASH WATER ONLY AT A DESIGNATED SITE. DO NOT DISCHARGE WATER IN THE ROADWAY DRAINAGE SYSTEM OR WATERS OF THE UNITED STATES. CONTACT DRINKING WATER BRANCH, DEPARTMENT OF HEALTH AT (808) 586-4309 TO RECEIVE PERMISSION TO DESIGNATE A DISPOSAL SITE. CLEAN DISPOSAL SITE AS REQUIRED OR AS REPRESENTED BY THE OWNER'S REPRESENTATIVE.

SPILL CONTROL PLAN:

- POST A SPILL PREVENTION PLAN TO INCLUDE MEASURES TO PREVENT AND CLEAN UP EACH SPILL.
- THE CONTRACTOR SHALL BE THE PREVENTION AND CLEAN-UP COORDINATOR. DESIGNATE AT LEAST THREE SITE PERSONNEL WHO SHALL RECEIVE SPILL PREVENTION AND CLEANUP TRAINING. THESE INDIVIDUALS SHALL EACH BECOME RESPONSIBLE FOR A PARTICULAR PHASE OF PREVENTION AND CLEANUP. POST THE NAMES OF RESPONSIBLE SPILL PERSONNEL IN THE MATERIAL STORAGE AREA AND IN THE OFFICE TRAILER ONSITE.
- CLEARLY POST MANUFACTURER'S RECOMMENDED METHODS FOR SPILL CLEANUP. MAKE SITE PERSONNEL AWARE OF THE PROCEDURES AND THE LOCATION OF INFORMATION AND CLEANUP SUPPLIES.

- KEEP MATERIAL AND EQUIPMENT NECESSARY FOR SPILL CLEANUP IN THE MATERIAL STORAGE AREA ONSITE.
- CLEAN UP ALL SPILLS IMMEDIATELY AFTER DISCOVERY.
- KEEP THE SPILL AREA WELL VENTILATED. PERSONNEL SHALL WEAR APPROPRIATE PROTECTIVE CLOTHING TO PREVENT INJURY FROM CONTACT WITH HAZARDOUS SUBSTANCES.
- REPORT SPILLS OF TOXIC HAZARDOUS MATERIAL TO THE APPROPRIATE STATE OR LOCAL GOVERNMENT AGENCY, REGARDLESS OF SIZE.

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENTS:

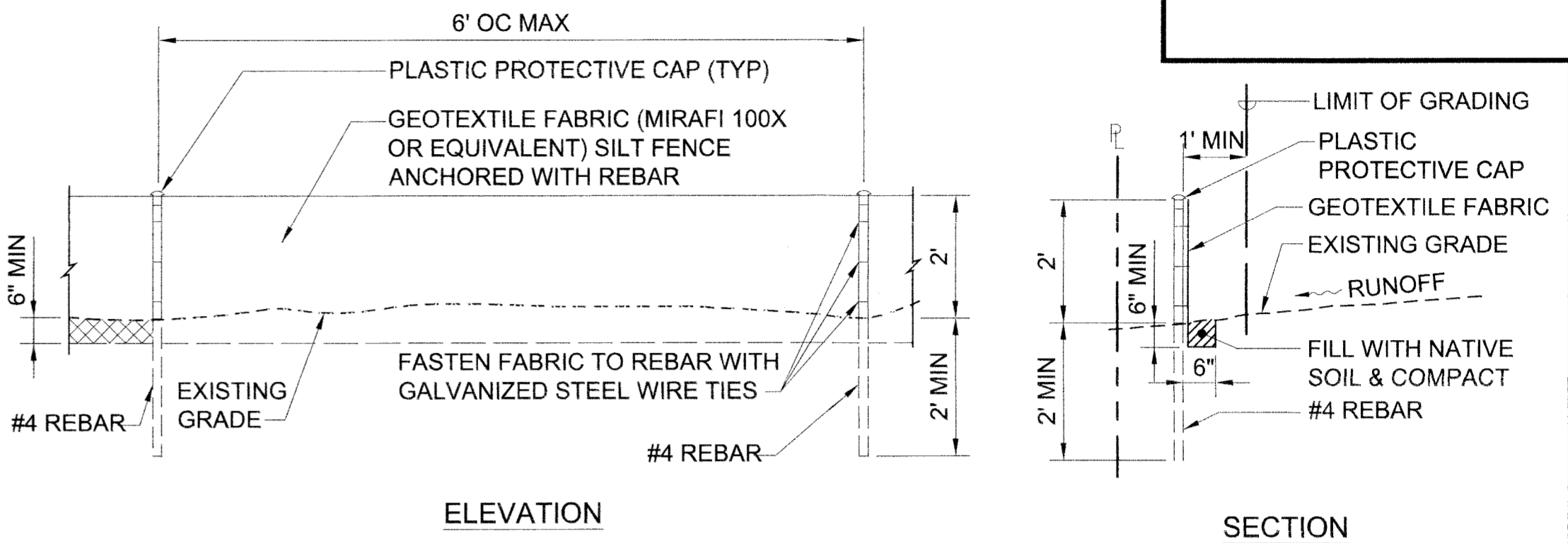
- THE CONTRACTOR SHALL APPLY FOR, OBTAIN AND COMPLY WITH THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) REQUIREMENTS FOR KAUAI DISTRICT PERMIT PROJECTS. THIS IS AVAILABLE AT THE KAUAI DISTRICT OFFICE AT 3040 UMI STREET, SUITE DUE TO POTENTIAL COSTS AND IMPACTS, THE CONTRACTOR NEEDS TO BE AWARE OF THESE REQUIREMENTS.
- THE CONTRACTOR SHALL OBTAIN AND COMPLY WITH NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT REQUIREMENTS FOR ALL PROJECTS WHICH WILL DISTURB ONE (1) ACRE OR MORE OF LAND. THE CONTRACTOR SHALL NOT START CONSTRUCTION UNTIL NOTICE OF GENERAL PERMIT COVERAGE (NGPC) IS RECEIVED FROM THE DEPARTMENT OF HEALTH, STATE OF HAWAII AND HAS SATISFIED ANY OTHER APPLICABLE REQUIREMENTS OF THE NPDES PERMIT PROGRAM.
- THE CONTRACTOR SHALL COMPLETE AND SUBMIT A CONTRACTOR'S CERTIFICATION OF NPDES COMPLIANCE, INCLUDING COMPLETION OF THE BEST MANAGEMENT PRACTICE (BMP) CHECKLIST AND SUBMITTAL OF A WRITTEN BMP PLAN AND DRAWINGS, PRIOR TO ISSUANCE OF THE PERMIT TO PERFORM WORK UPON COUNTY ROADWAYS.

EROSION CONTROL BMPs:

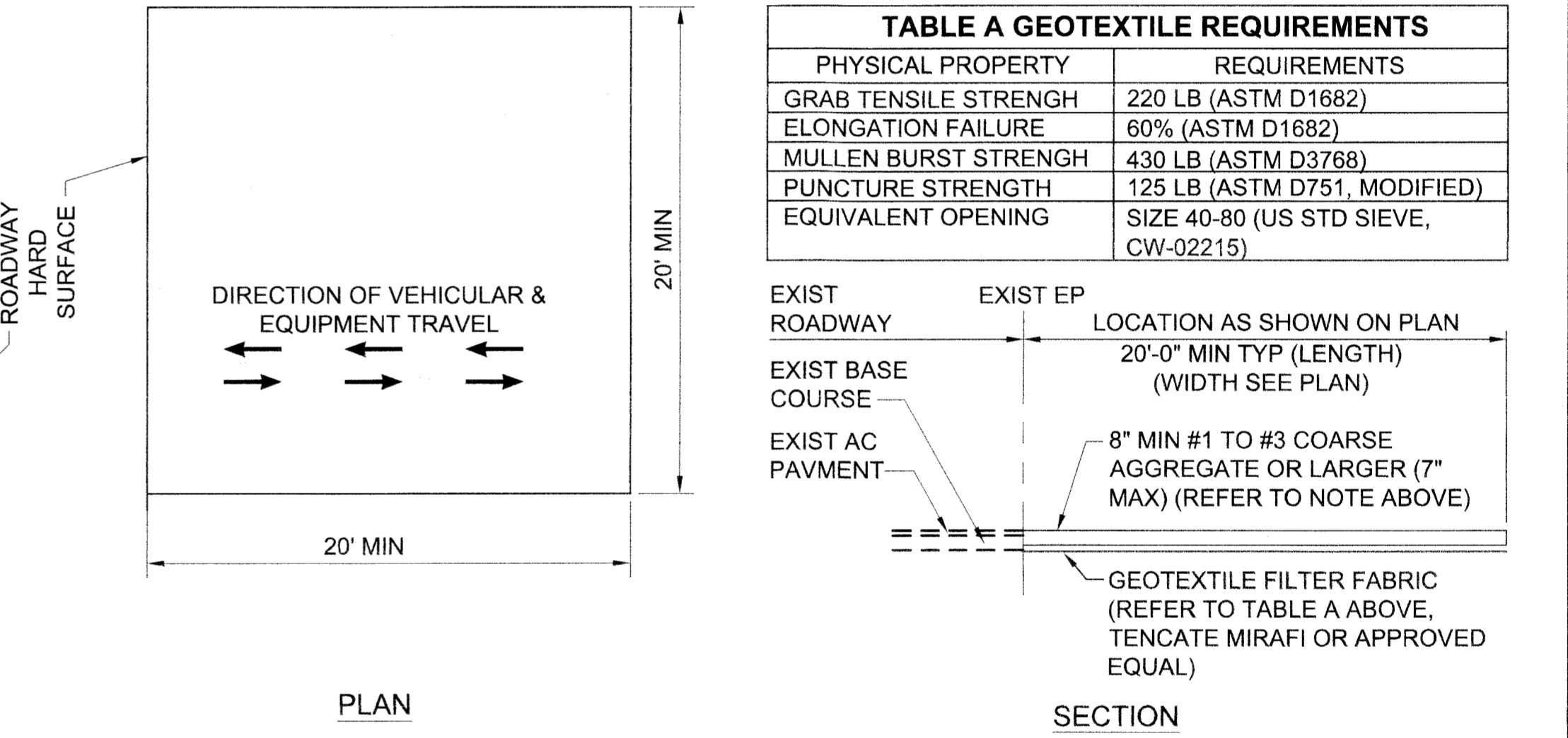
- CONTAIN LIMIT CONSTRUCTION EQUIPMENT AND ACTIVITIES TO THE LIMITS OF CONSTRUCTION SHOWN ON THESE PLANS.
- PRE-CONSTRUCTION VEGETATIVE GROUND COVER SHALL NOT BE DESTROYED, REMOVED OR DISTURBED MORE THAN TWENTY (20) CALENDAR DAYS PRIOR TO LAND DISTURBANCE.
- TEMPORARY SOIL STABILIZATION SHALL BE APPLIED ON AREAS THAT WILL REMAIN UNFINISHED FOR MORE THAN THIRTY (30) CALENDAR DAYS. VEGETATIVE COVER SHALL BE PLANTED WITHIN A PERIOD OF THIRTY (30) CALENDAR DAYS AFTER THE SITE HAS BEEN GRADED.
- PERMANENT SOIL STABILIZATION WITH VEGETATION OR PAVEMENT SHALL BE APPLIED AS SOON AS PRACTICAL. TEMPORARY IRRIGATION AND MAINTENANCE OF THE PERMANENT VEGETATION SHALL BE PROVIDED FOR NINETY (90) DAYS AFTER COMPLETION OF VEGETATIVE INSTALLATION UNTIL ROOTS ARE THOROUGHLY ESTABLISHED AND STABILIZED TO THE SATISFACTION OF AND ACCEPTANCE BY DOW.
- PLANTING AND MAINTENANCE OF GRASS SHALL CONFORM TO THE SPECIFICATIONS, "HAWAII STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION," DATED 2005 AND ITS SPECIAL PROVISIONS / AMENDMENTS AND "STANDARDS SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION," DATED SEPTEMBER 1986, AS AMENDED OF THE STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION, HIGHWAYS DIVISION; & COUNTY OF KAUAI, DEPARTMENT OF PUBLIC WORKS, RESPECTIVELY.

SEDIMENT CONTROL BMPs:

- INSTALL SEDIMENT CONTROL BMPs, INCLUDING TEMPORARY CONTRACTOR OPERATIONS AND STAGING AREA (COSA), FILTER SOCKS AND STABILIZED CONSTRUCTION INGRESS/EGRESS AS INDICATED ON THESE PLANS TO AID IN THE REMOVAL AND DIRT/MUD FROM ACCUMULATING ON THE TIRES OF TRUCKS EXITING THE PROJECT SITE AND BEING TRACKED ONTO PUBLIC ROAD PAVEMENTS.
- PROVIDE PERIMETER SEDIMENT CONTROL BMPs AROUND ALL AREAS OF ACTIVE CONSTRUCTION, INCLUDING STOCKPILES, COSA, EXCAVATIONS, GRUBBED AREAS, AND AREAS WHERE PERMANENT SURFACE RESTORATION HAS NOT BEEN ESTABLISHED.
- ALL SEDIMENT CONTROL BMPs SHALL BE CLEARED OF SILT IMMEDIATELY FOLLOWING THE END OF ANY RAINFALL THAT CAUSES SILT BUILDUP BEHIND THE BMP.
- ALL SEDIMENT CONTROL BMPs SHALL BE INSPECTED DAILY FOR DAMAGE AND MAINTAINED SO THAT THEY ARE WORKING PROPERLY.
- THE CONTRACTOR SHALL SWEEP AND VACUUM STREETS USING EQUIPMENT SPECIFICALLY INTENDED FOR REMOVING SEDIMENTS FROM PAVED ROADWAYS. SWEEPING AND VACUUMING EQUIPMENT SHALL NOT CAUSE FUGITIVE DUST EMISSIONS. THE CONTRACTOR SHALL NOT USE KICK BROOMS OR SWEEPER ATTACHMENTS.
- THE CONTRACTOR SHALL SWEEP AND VACUUM STREETS OF SEDIMENT DAILY DURING TRENCHING AND EXCAVATION ACTIVITIES. THE CONTRACTOR SHALL NOT WASH SEDIMENT FROM THE CONSTRUCTION SITE TO SURROUNDING AREAS. COLLECTED SEDIMENT SHALL BE DISPOSED OF AS DIRECTED BY THE ENGINEER.



SILT FENCE DETAIL
SCALE: NONE
A C-001



STABILIZED CONSTRUCTION INGRESS/EGRESS
SCALE: NONE
B C-001

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

REVISION	DATE	BY	APPROVED
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DEPARTMENT OF WATER
COUNTY OF KAUAI

JOB NO. WKK-03

MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2
KĪLAUEA, KAUAI, HAWAII

EROSION AND SEDIMENT CONTROL NOTES AND DETAILS

DESIGNED BY: AC DRAWN BY: YN CHECKED BY: GL

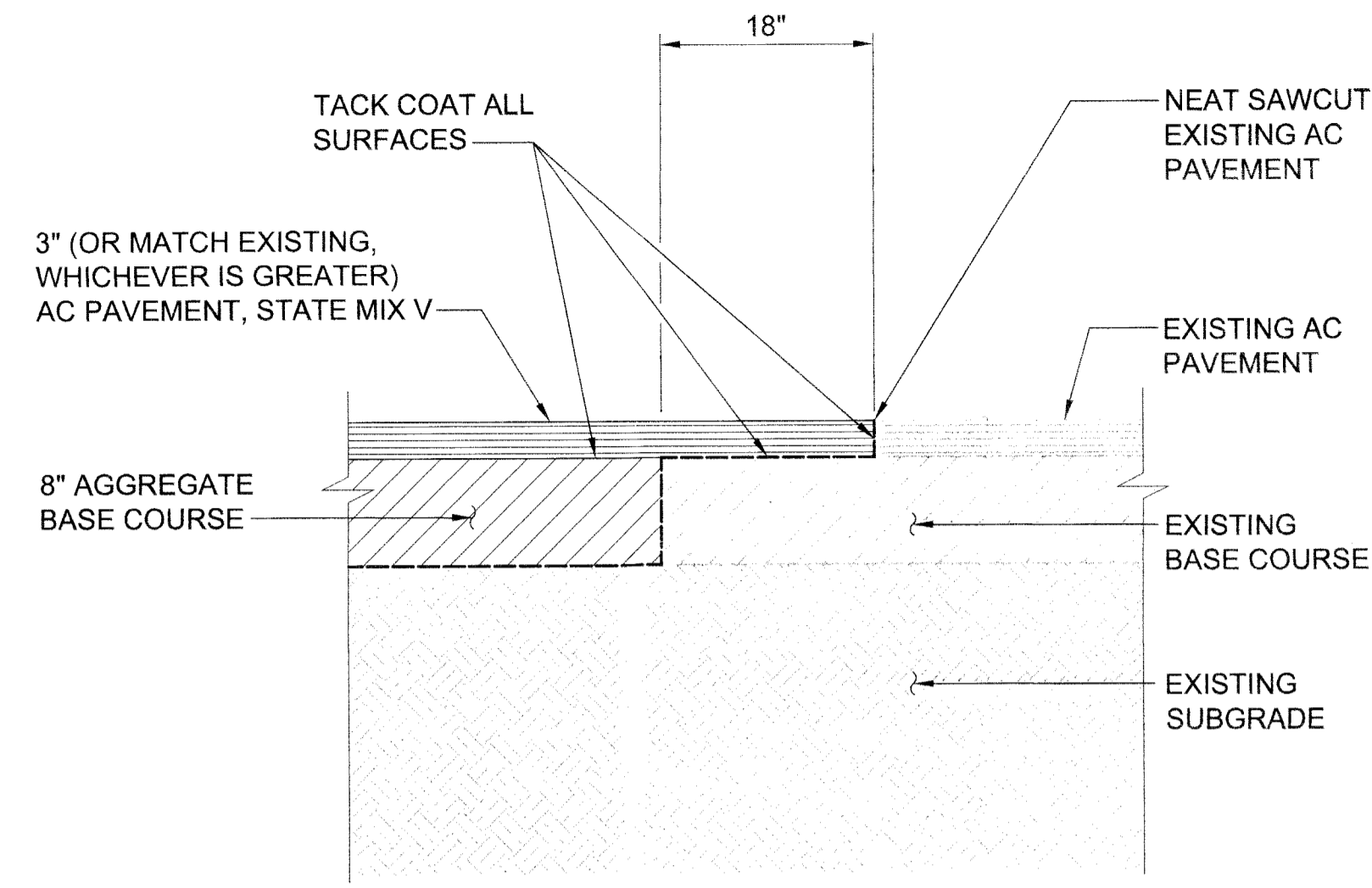
APPROVED BY: *[Signature]* 3/11/19
MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI DATE

BY: *[Signature]* 4/30/20 EXP. DATE

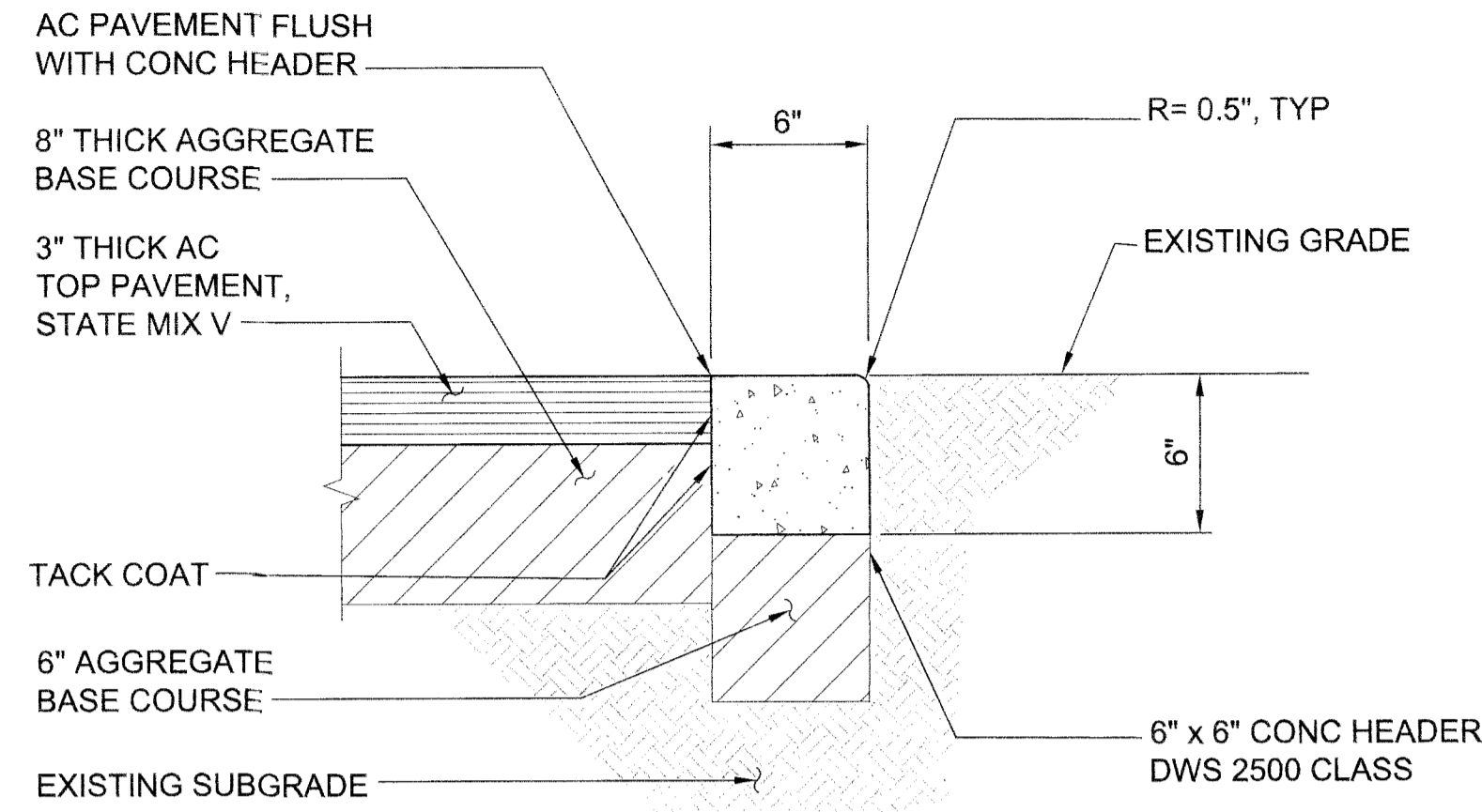
SHEET 6 OF 60 SHEETS C-001

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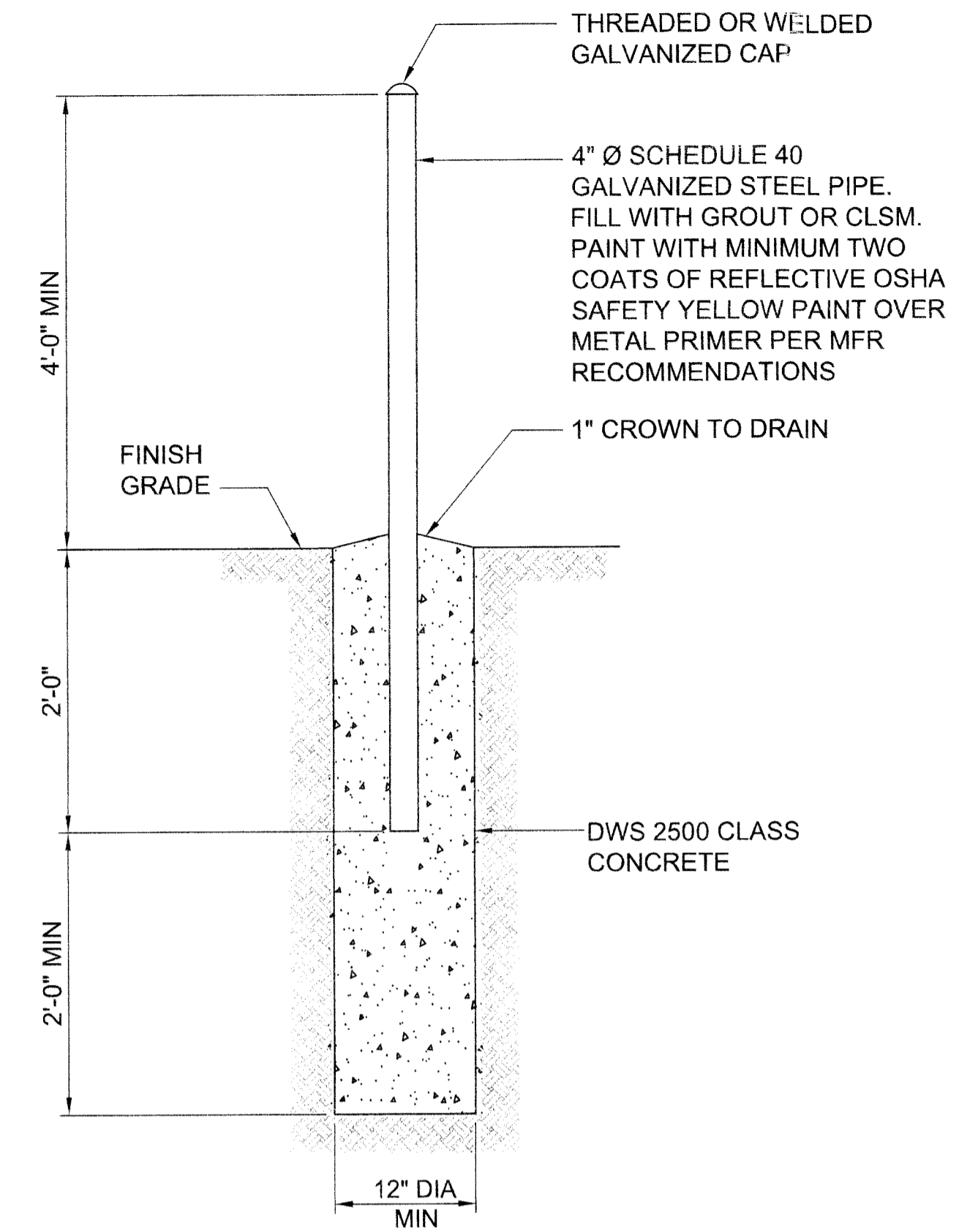
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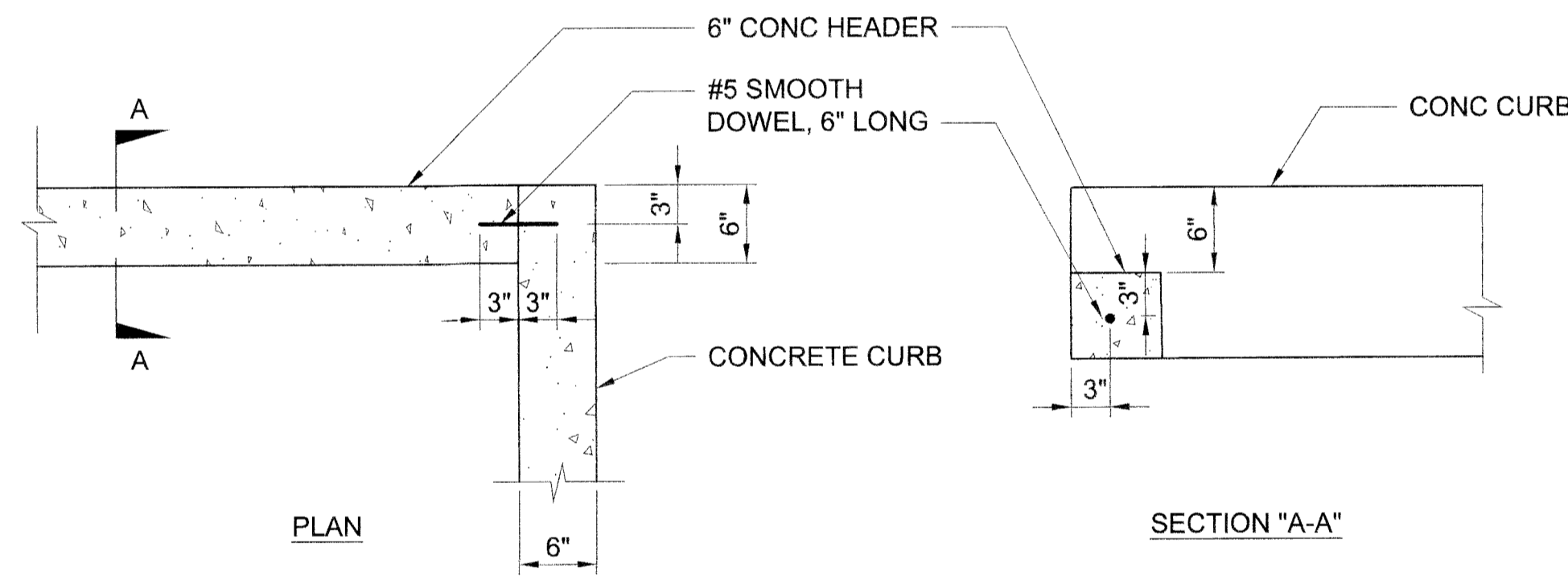
AC PAVEMENT
DETAIL A
 C-002
 NOT TO SCALE



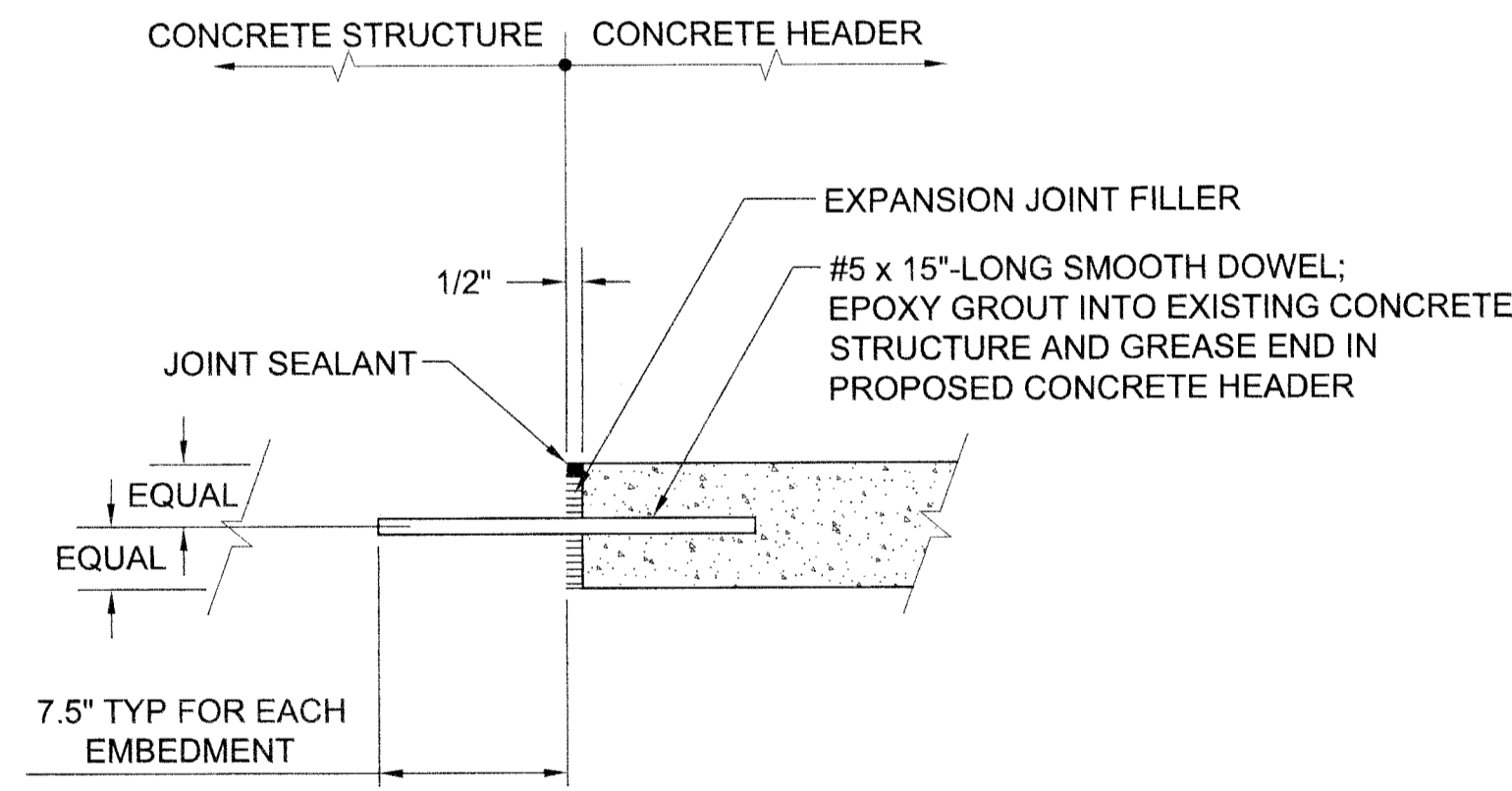
CONCRETE HEADER
DETAIL B
 C-002
 NOT TO SCALE



FIXED BOLLARD
DETAIL C
 C-002
 SCALE: NONE



CONCRETE HEADER/CURB CONNECTION
DETAIL D
 C-002
 NOT TO SCALE



TYPICAL DOWELED CONCRETE CONNECTION
DETAIL E
 C-002
 NOT TO SCALE

	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)			
	REVISION	DATE	BY	APPROVED
	DEPARTMENT OF WATER COUNTY OF KAUAI JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII			
	CIVIL DETAILS DESIGNED BY: AC DRAWN BY: YN CHECKED BY: GL APPROVED BY: <i>[Signature]</i> DATE: 3/11/19 <small>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</small>			
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.")		SHEET 7 OF 60 SHEETS C-002		

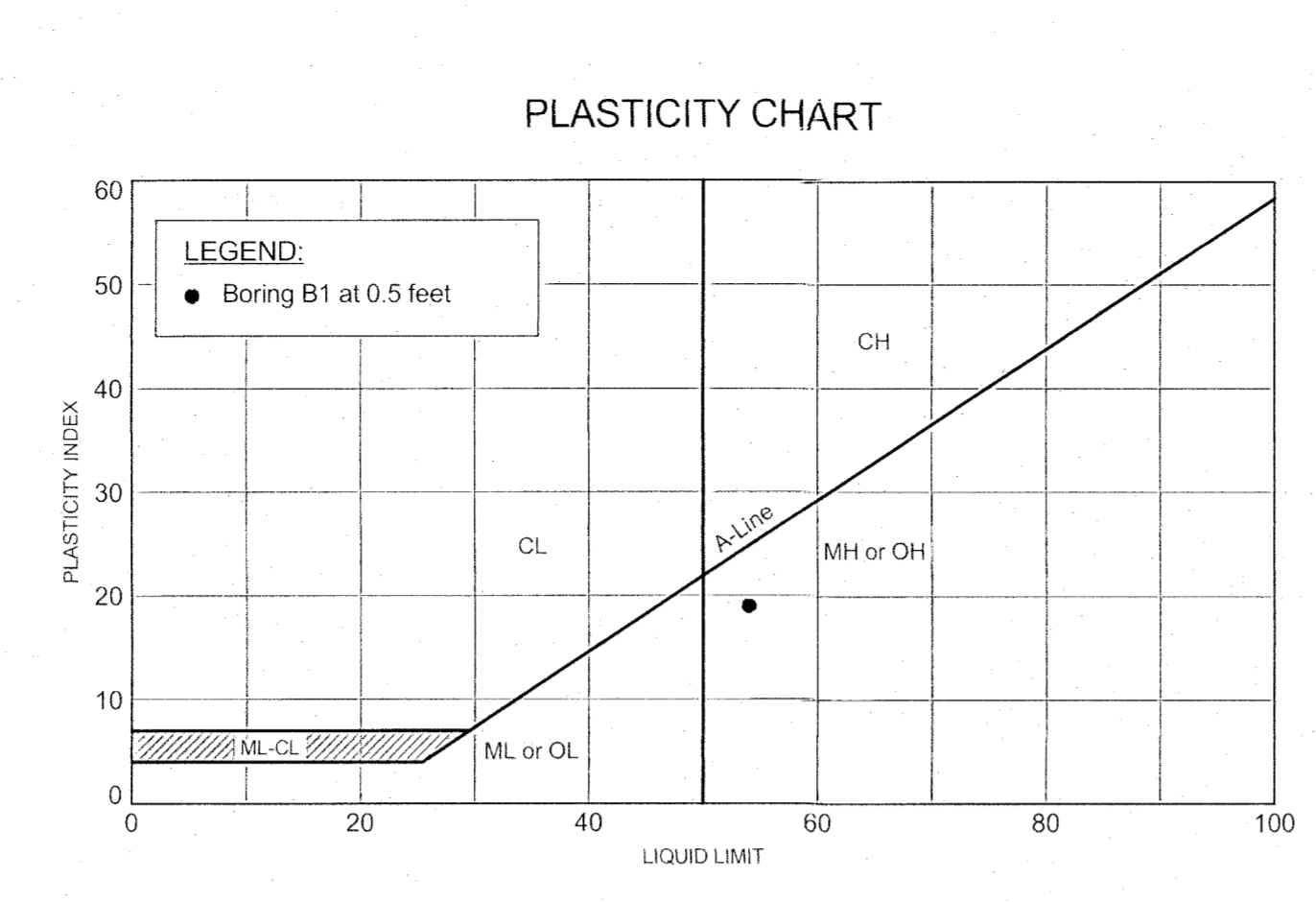
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MAJOR DIVISIONS		GROUP DIVISIONS	TYPICAL NAMES
COARSE GRAINED SOILS (More than 50% of the material is LARGER than No. 200 sieve size.)	GRAVELS (More than 50% of coarse fraction is LARGER than the No. 4 sieve size.)	CLEAN GRAVELS (Little or no fines.)	GW Well graded gravels, gravel-sand mixtures, little or no fines. GP Poorly graded gravels or gravel-sand mixtures, little or no fines.
		GRAVELS WITH FINES (Appreciable amt. of fines.)	GM Silty gravels, gravel-sand-silt mixtures. GC Clayey gravels, gravel-sand-clay mixtures.
	SANDS (More than 50% of coarse fraction is SMALLER than the No. 4 sieve size.)	CLEAN SANDS (Little or no fines.)	SW Well graded sands, gravelly sands, little or no fines. SP Poorly graded sands or gravelly sands, little or no fines.
		SANDS WITH FINES (Appreciable amt. of fines.)	SM Silty sands, sand-silt mixtures. SC Clayey sands, sand-clay mixtures.
	FINE GRAINED SOILS (More than 50% of the material is SMALLER than No. 200 sieve size.)	SILTS AND CLAYS (Liquid limit LESS than 50.)	ML Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity. CL Inorganic clays of high plasticity, lean clays.
		SILTS AND CLAYS (Liquid limit GREATER than 50.)	OL Organic silts and organic silty clays of low plasticity. MH Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts. CH Inorganic clays of high plasticity, fat clays.
HIGHLY ORGANIC SOILS		PT Peat and other highly organic silts.	
FORMATIONS		FRESH TO MODERATELY WEATHERED BASALT	
		VOLCANIC TUFF / HIGHLY TO COMPLETELY WEATHERED BASALT	
		CORAL	

SAMPLE DEFINITION		
		RQD: Rock Quality Designation

Kilauea Wells Generator Shelter

HIRATA & ASSOCIATES, INC. Geotechnical Engineering W.O. 17-6087	BORING LOG LEGEND	Plate A3.1
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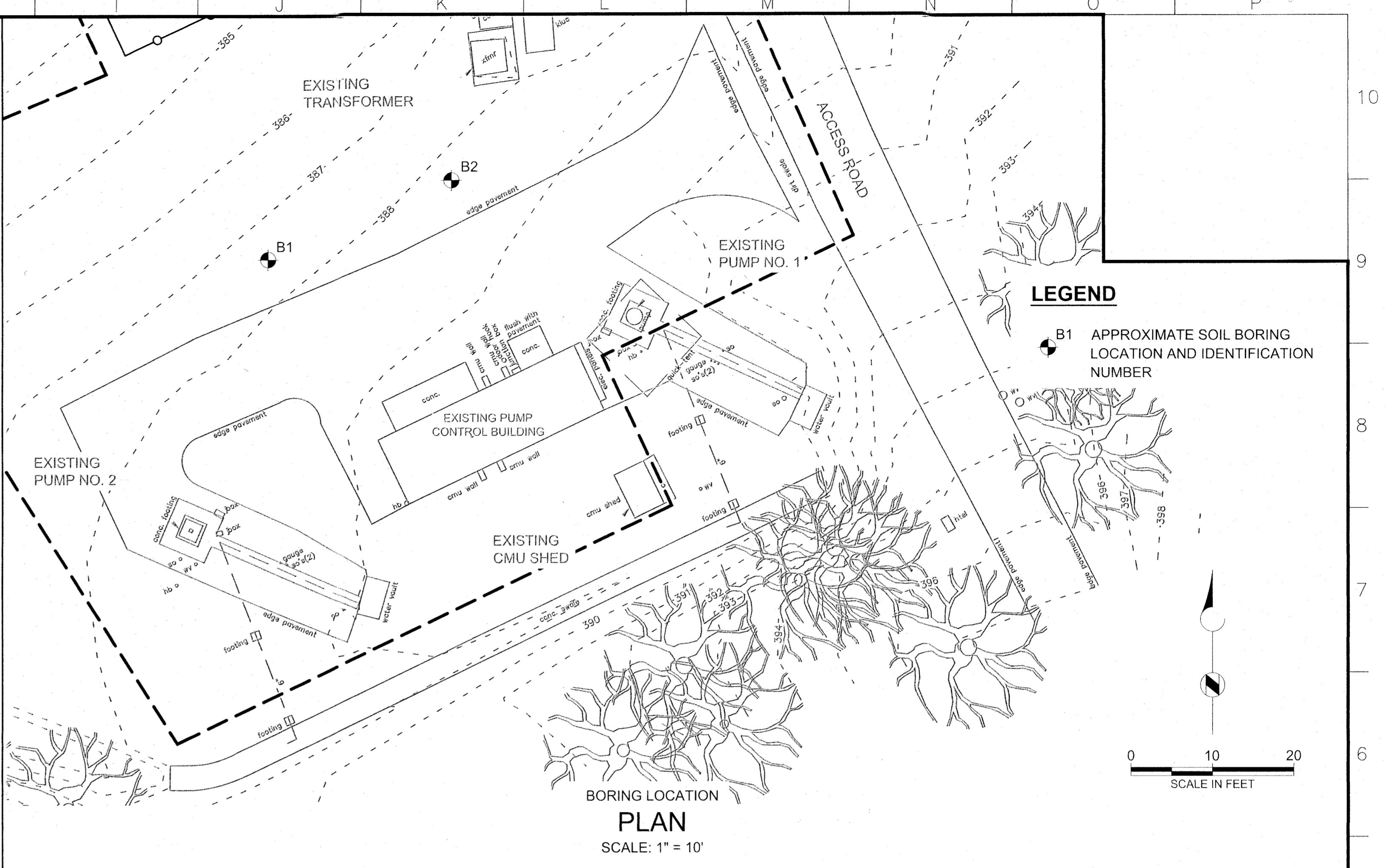


GRADATION CHART

COMPONENT DEFINITIONS BY GRADATION	
COMPONENT	SIZE RANGE
Boulders	Above 12 in.
Cobbles	3 in. to 12 in.
Gravel	3 in. to No. 4 (4.76 mm)
Coarse	3 in. to 3/4 in.
Fine Gravel	3/4 in. to No. 4 (4.76 mm)
Sand	No. 4 (4.76 mm) to No. 200 (0.074mm)
Coarse Sand	No. 4 (4.76 mm) to No. 10 (2.0 mm)
Medium Sand	No. 10 (2.0 mm) to No. 40 (0.42 mm)
Fine Sand	No. 40 (0.42 mm) to No. 200 (0.074 mm)
Silt and Clay	Smaller than No. 200 (0.074 mm)

Kilauea Wells Generator Shelter

HIRATA & ASSOCIATES, INC. Geotechnical Engineering W.O. 17-6087	UNIFIED SOIL CLASSIFICATION SYSTEM	Plate A3.2
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Grade	Symbol	Description
Fresh	F	No visible signs of decomposition or discoloration. Rings under hammer impact.
Slightly Weathered	WS	Slight discoloration inwards from open fractures, otherwise similar to F.
Moderately Weathered	WM	Discoloration throughout. Weaker minerals such as feldspar decomposed. Strength somewhat less than fresh rock but cores cannot be broken by hand or scraped by knife. Texture preserved.
Highly Weathered	WH	Most minerals somewhat decomposed. Specimens can be broken by hand with effort or shaved with knife. Core stones present in rock mass. Texture becoming indistinct but fabric preserved.
Completely Weathered	WC	Minerals decomposed to soil but fabric and structure preserved (Saprolite). Specimens easily crumbled or penetrated.
Residual Soil	RS	Advance state of decomposition resulting in plastic soils. Rock fabric and structure completely destroyed. Large volume change.

Reference: Soil Mechanics, NAVFAC DM-7.1, Department of the Navy, Naval Facilities Engineering Command, September, 1986.

Kilauea Wells Generator Shelter

HIRATA & ASSOCIATES, INC. Geotechnical Engineering W.O. 17-6087	ROCK WEATHERING CLASSIFICATION SYSTEM	Plate A3.3
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Boring No. B1

BORING LOG

PROJECT NAME: Kilauea Wells Generator Shelter
 WORK ORDER NO. 17-6087 DRIVING WT. 140 lb. START DATE 5/26/17
 SURFACE ELEV. NA DROP 30 in. END DATE 5/26/17

REMARKS/SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
Swell Test			8	69	55				Clayey SILT (MH) - Brown, moist, firm, with sand and gravel.
Consolidation Test			9	64	61				Clayey SILT (MH) - Mottled brown, moist, medium stiff. (COMPLETELY WEATHERED BASALT)
			12	59	56				Firm from 9 feet.
			7	66	56	10			
			7	71	47	15			
End boring at 15.5 feet.									
Neither groundwater nor seepage water encountered.									

Plate A4.1

Boring No. B2

BORING LOG

PROJECT NAME: Kilauea Wells Generator Shelter
 WORK ORDER NO. 17-6087 DRIVING WT. 140 lb. START DATE 5/26/17
 SURFACE ELEV. NA DROP 30 in. END DATE 5/26/17

REMARKS/SAMPLE NO.	CORE RECOVERY (%)	RQD (%)	BLOWS PER FOOT	DRY DENSITY (pcf)	MOISTURE CONTENT (%)	DEPTH (ft)	GRAPHIC LOG	SAMPLE	MATERIAL DESCRIPTION
Direct Shear Test			10	78	58				Clayey SILT (MH) - Brown, moist, firm, with sand and gravel.
			11	65	55	5			Clayey SILT (MH) - Mottled brown, moist, medium stiff. (COMPLETELY WEATHERED BASALT)
Consolidation Test			12	69	51				Firm from 13 feet.
			9	68	52				
End boring at 14.5 feet.									
Neither groundwater nor seepage water encountered.									

Plate A4.2

DEPARTMENT OF WATER
COUNTY OF KAUAI

JOB NO. WKK-03

MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2
KILAUEA, KAUAI, HAWAII

BORING LOCATION PLAN, LEGEND, CLASSIFICATIONS, AND LOGS

DESIGNED BY: AC DRAWN BY: YN CHECKED BY: GL

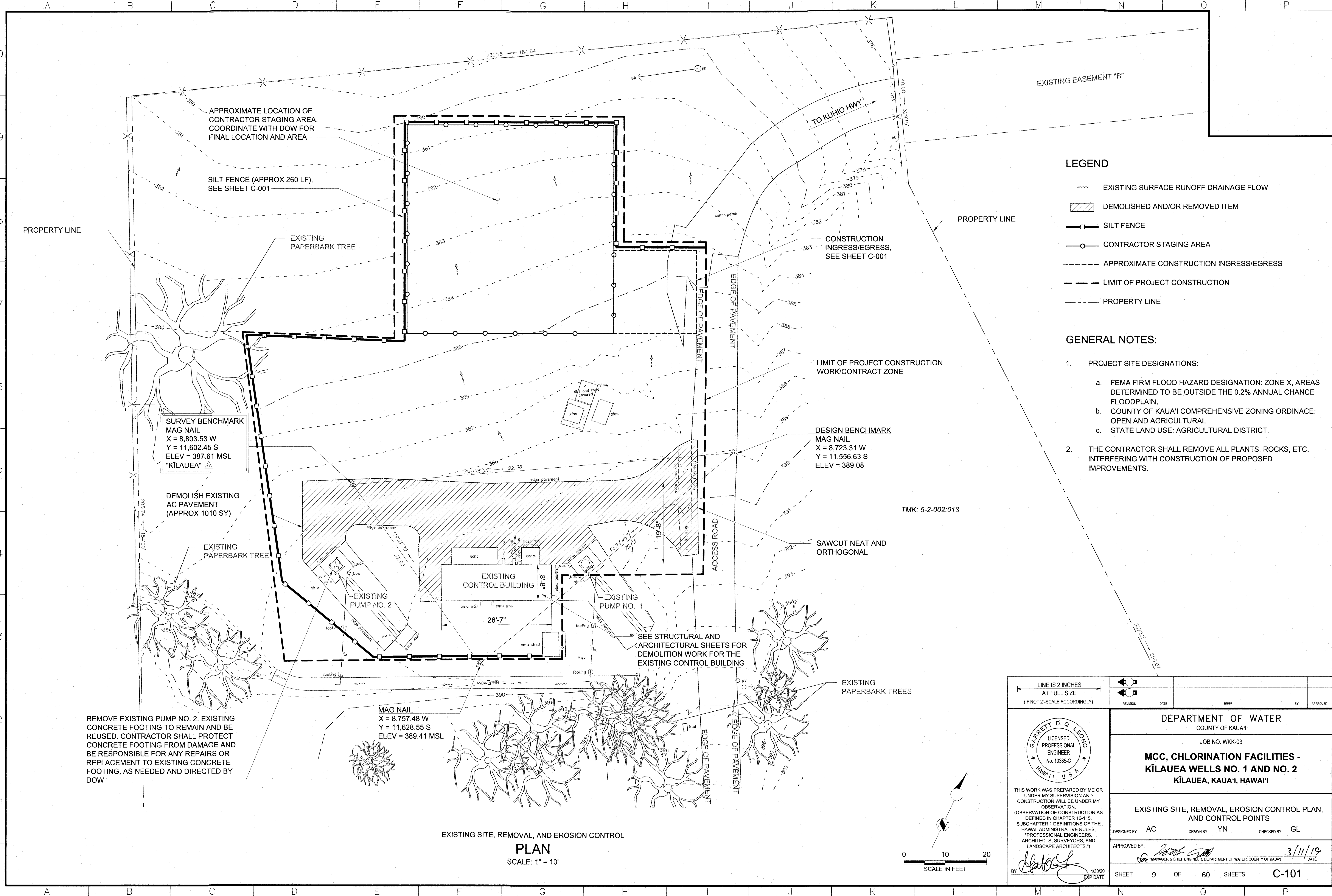
APPROVED BY: DATE: 3/11/19

MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI

SHEET 8 OF 60 SHEETS C-003

4/30/20
EXP DATE

Path: \\hrc\hrc\p01\projects\Kilauea Wells MCC Design\400 Design\CADD\SHEETS\CIVIL File Name: 150756-SF-C-101.dwg Plot Date: November 13, 2018 - 9:26 AM CADD User: Yolanda Noda



- LEGEND**
- EXISTING SURFACE RUNOFF DRAINAGE FLOW
 - DEMOLISHED AND/OR REMOVED ITEM
 - SILT FENCE
 - CONTRACTOR STAGING AREA
 - APPROXIMATE CONSTRUCTION INGRESS/EGRESS
 - LIMIT OF PROJECT CONSTRUCTION
 - PROPERTY LINE

- GENERAL NOTES:**
1. PROJECT SITE DESIGNATIONS:
 - a. FEMA FIRM FLOOD HAZARD DESIGNATION: ZONE X, AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN.
 - b. COUNTY OF KAUAI COMPREHENSIVE ZONING ORDINANCE: OPEN AND AGRICULTURAL
 - c. STATE LAND USE: AGRICULTURAL DISTRICT.
 2. THE CONTRACTOR SHALL REMOVE ALL PLANTS, ROCKS, ETC. INTERFERING WITH CONSTRUCTION OF PROPOSED IMPROVEMENTS.

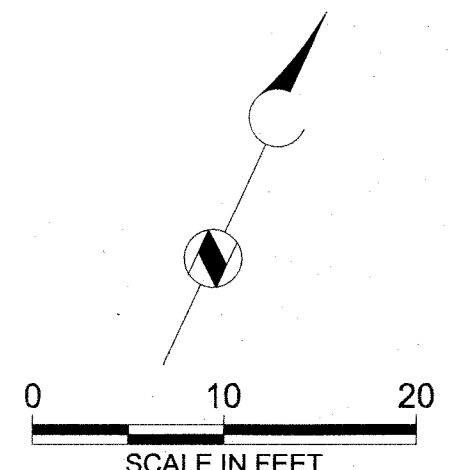
**SURVEY BENCHMARK
MAG NAIL**
X = 8,803.53 W
Y = 11,602.45 S
ELEV = 387.61 MSL
"KILAUEA"

**DESIGN BENCHMARK
MAG NAIL**
X = 8,723.31 W
Y = 11,556.63 S
ELEV = 389.08

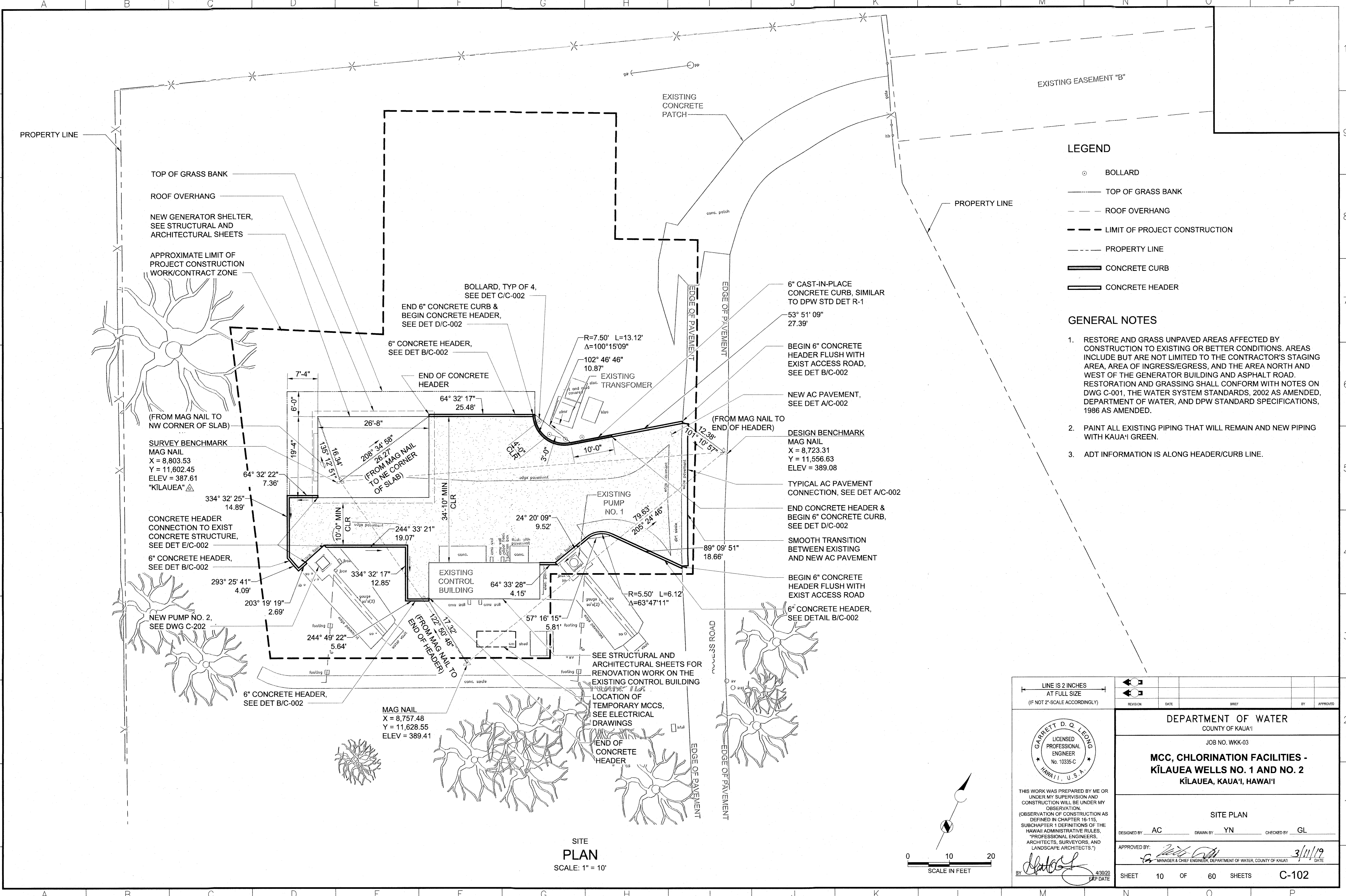
MAG NAIL
X = 8,757.48 W
Y = 11,628.55 S
ELEV = 389.41 MSL

<p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.")</p> <p>BY: 4/30/20 EXP. DATE</p>	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)			
	DEPARTMENT OF WATER COUNTY OF KAUAI JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII			
	EXISTING SITE, REMOVAL, EROSION CONTROL PLAN, AND CONTROL POINTS DESIGNED BY: AC DRAWN BY: YN CHECKED BY: GL			
	APPROVED BY: 3/11/19 MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI DATE			
SHEET 9 OF 60 SHEETS		C-101		

EXISTING SITE, REMOVAL, AND EROSION CONTROL
PLAN
SCALE: 1" = 10'



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LEGEND

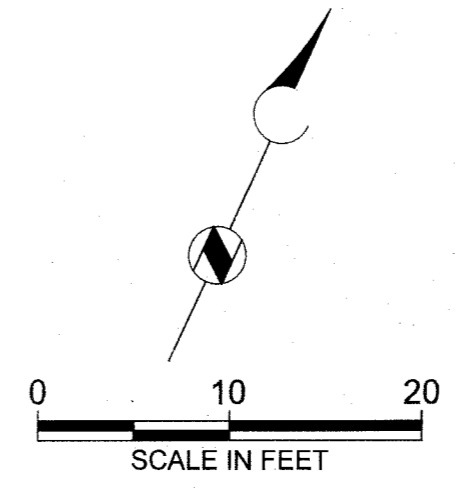
- BOLLARD
- TOP OF GRASS BANK
- - - ROOF OVERHANG
- - - - - LIMIT OF PROJECT CONSTRUCTION
- - - - - PROPERTY LINE
- ▬ CONCRETE CURB
- ▬ CONCRETE HEADER

GENERAL NOTES

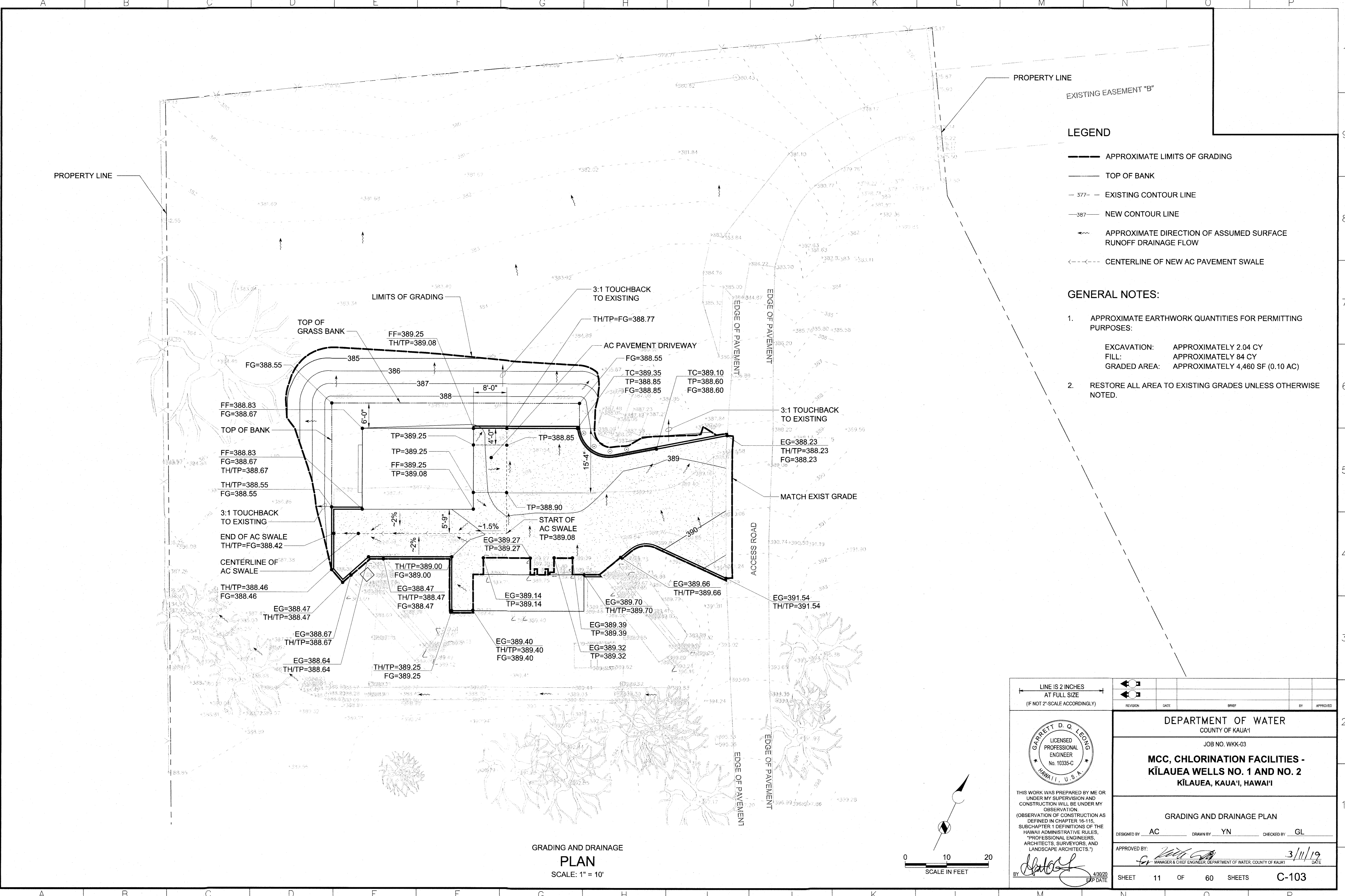
1. RESTORE AND GRASS UNPAVED AREAS AFFECTED BY CONSTRUCTION TO EXISTING OR BETTER CONDITIONS. AREAS INCLUDE BUT ARE NOT LIMITED TO THE CONTRACTOR'S STAGING AREA, AREA OF INGRESS/EGRESS, AND THE AREA NORTH AND WEST OF THE GENERATOR BUILDING AND ASPHALT ROAD. RESTORATION AND GRASSING SHALL CONFORM WITH NOTES ON DWG C-001, THE WATER SYSTEM STANDARDS, 2002 AS AMENDED, DEPARTMENT OF WATER, AND DPW STANDARD SPECIFICATIONS, 1986 AS AMENDED.
2. PAINT ALL EXISTING PIPING THAT WILL REMAIN AND NEW PIPING WITH KAUA'I GREEN.
3. ADT INFORMATION IS ALONG HEADER/CURB LINE.

SITE PLAN
SCALE: 1" = 10'

<p>LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">REVISION</th> <th style="width: 10%;">DATE</th> <th style="width: 10%;">BY</th> <th style="width: 10%;">APPROVED</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISION	DATE	BY	APPROVED				
REVISION	DATE	BY	APPROVED						
	<p>DEPARTMENT OF WATER COUNTY OF KAUA'I</p> <p>JOB NO. WKK-03</p> <p>MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUA'I, HAWAII</p>								
<p>SITE PLAN</p>									
<p>DESIGNED BY: AC DRAWN BY: YN CHECKED BY: GL</p>									
<p>APPROVED BY: <i>[Signature]</i> DATE: 3/11/19</p> <p>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUA'I</p>									
<p>SHEET 10 OF 60 SHEETS C-102</p>									



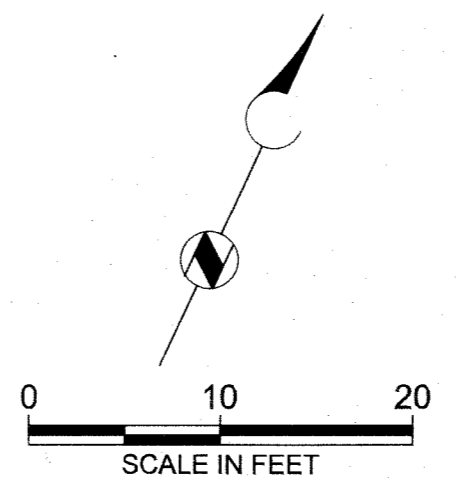
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- LEGEND**
- APPROXIMATE LIMITS OF GRADING
 - TOP OF BANK
 - 377 - EXISTING CONTOUR LINE
 - 387 - NEW CONTOUR LINE
 - ↔ APPROXIMATE DIRECTION OF ASSUMED SURFACE RUNOFF DRAINAGE FLOW
 - CENTERLINE OF NEW AC PAVEMENT SWALE

- GENERAL NOTES:**
- APPROXIMATE EARTHWORK QUANTITIES FOR PERMITTING PURPOSES:
 - EXCAVATION: APPROXIMATELY 2.04 CY
 - FILL: APPROXIMATELY 84 CY
 - GRADED AREA: APPROXIMATELY 4,460 SF (0.10 AC)
 - RESTORE ALL AREA TO EXISTING GRADES UNLESS OTHERWISE NOTED.

GRADING AND DRAINAGE PLAN
 SCALE: 1" = 10'

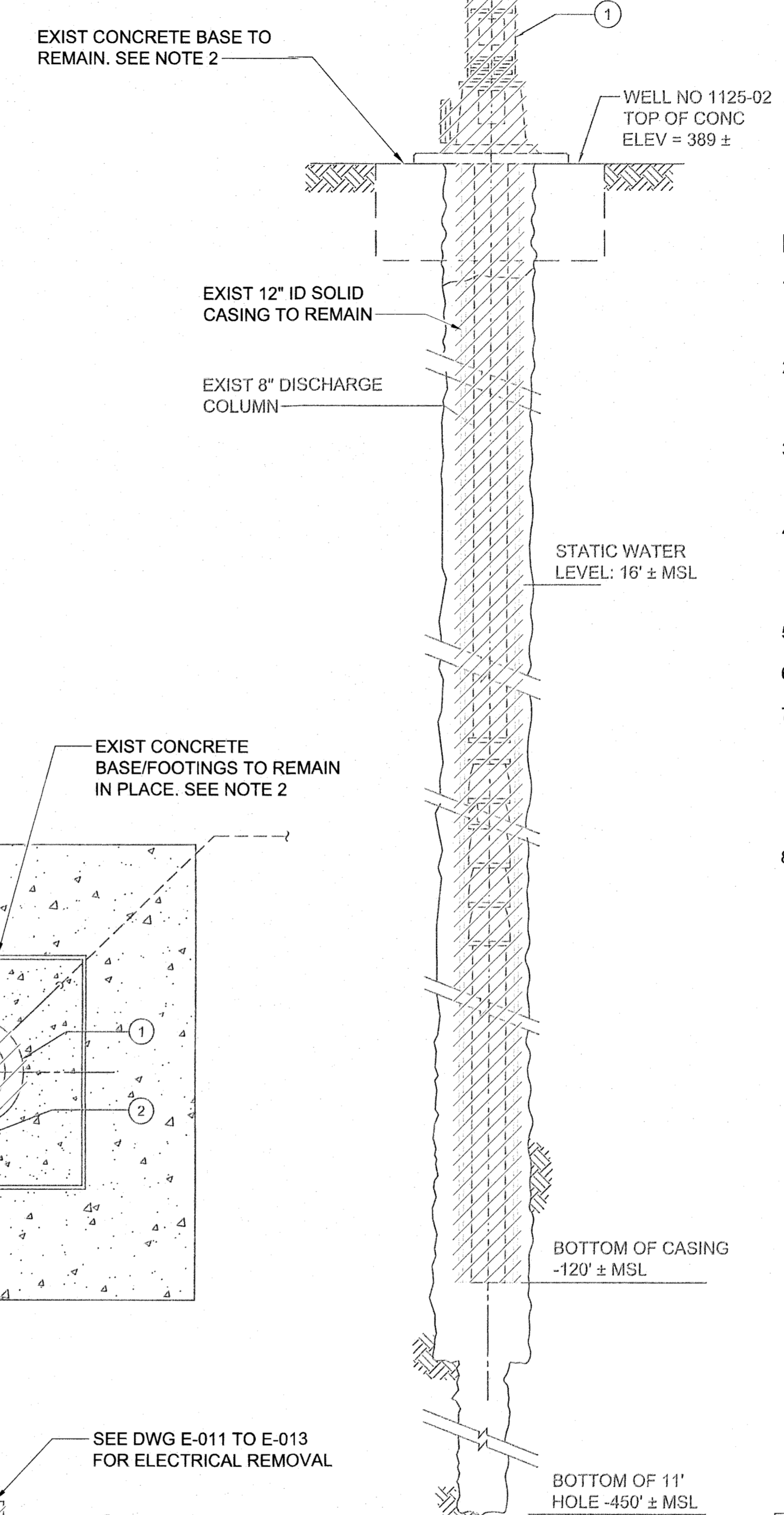


<p> GARRETT D. Q. LEONG LICENSED PROFESSIONAL ENGINEER No. 10335-C HAWAII, U.S.A. </p>	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)			
	REVISION DATE SHEET	DATE SHEET	BY SHEET	APPROVED SHEET
DEPARTMENT OF WATER COUNTY OF KAUAI JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2 KĪLAUEA, KAUAI, HAWAII				
GRADING AND DRAINAGE PLAN				
DESIGNED BY AC DRAWN BY YN CHECKED BY GL				
APPROVED BY: <i>[Signature]</i> 3/11/19 MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI				
SHEET 11 OF 60 SHEETS C-103				

KEY NOTES

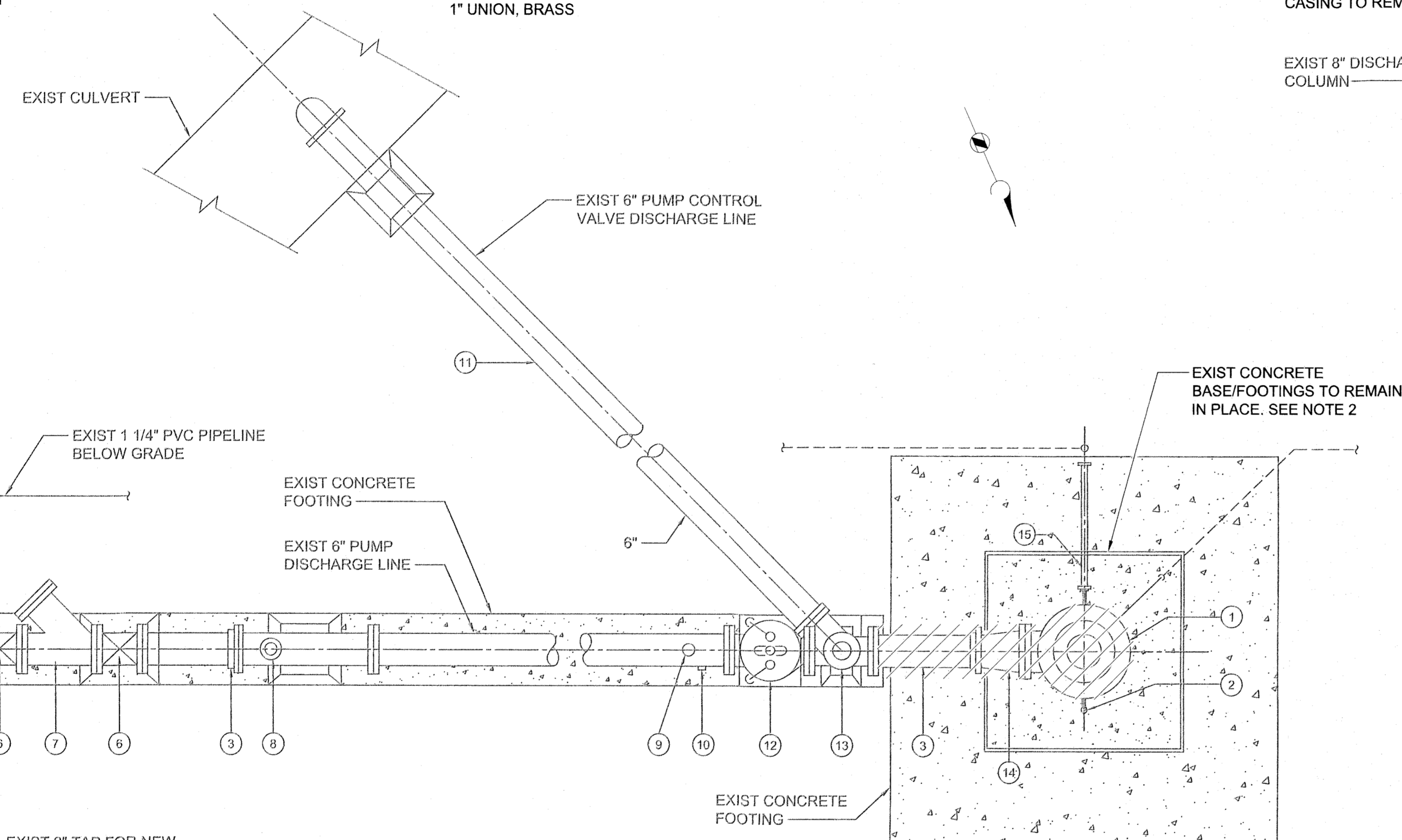
- ① EXISTING 125 HP PUMP MOTOR, TO BE REMOVED AND REPLACED
- ② 1" TAP BETWEEN CASING & DISCHARGE COLUMN FOR AIR & VACUUM RELIEF VALVE. DISCONNECT DURING PUMP AND MOTOR REMOVAL AND RECONNECT TO NEW PUMP AND MOTOR ASSEMBLY PER MFR RECOMMENDATIONS
- ③ 6" FLANGE COUPLING ADAPTER, TO BE REMOVED AND REPLACED.
- ④ 6" 1/8 TV BEND, FE
- ⑤ REMOVED AIR AND VACUUM RELIEF VALVE (PLUGGED)
- ⑥ 6" GATE VALVE, PDF OS&Y W/ HAND WHEEL
- ⑦ 6" WYE W/ BLIND FLANGE
- ⑧ 6" METER, FE
- ⑨ VANE TYPE FLOW SWITCH
- ⑩ SAMPLING CONNECTION
- ⑪ 6" GALV STEEL PIPE (PUMP CONTROL VALVE DISCHARGE)
- ⑫ 6" CHECK VALVE
- ⑬ 6"x6" TEE, FE W/ 6" PUMP CONTROL VALVE (OLA VALVE MODEL CLO-GE)
- ⑭ 8"x6" ECCENTRIC REDUCER, TO BE REMOVED AND REPLACED.
- ⑮ PRELUBE LINE: DISCONNECT DURING PUMP AND MOTOR REMOVAL, AND RECONNECT TO NEW PUMP AND MOTOR ASSEMBLY PER MFR RECOMMENDATIONS.

- 1" UNION, BRASS
- 1" BRASS COCK
- 1" BRONZE BODY STRAINER MAGNETIC FLOW SWITCH
- 1" BRASS NIPPLE
- 1" SOLENOID VALVE
- 1" UNION, BRASS

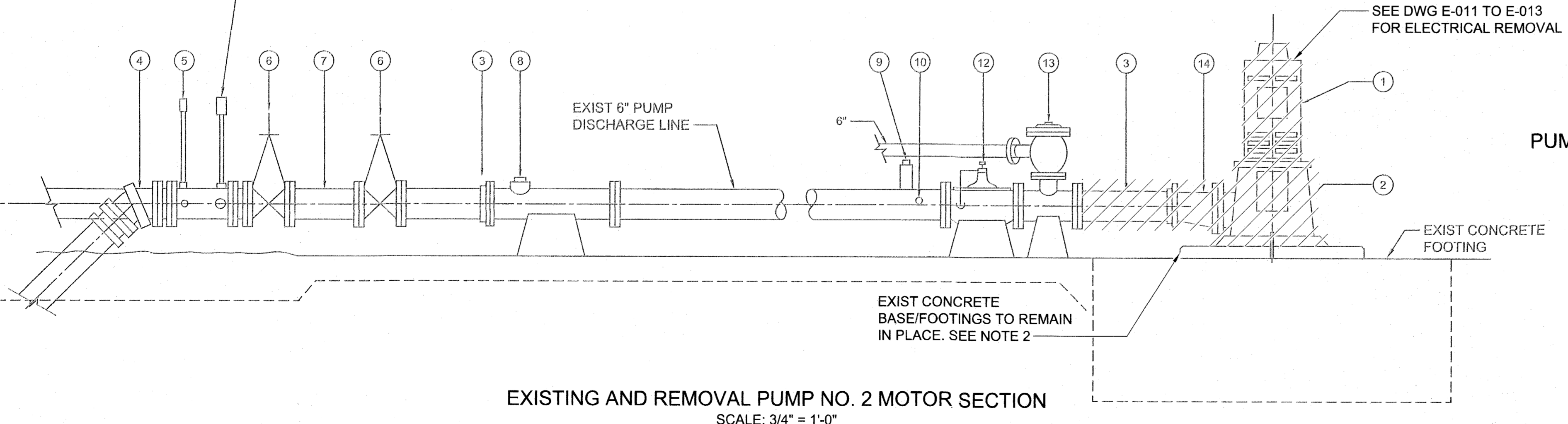


NOTES:

1. THE EXISTING PUMP NO. 2 AND ASSOCIATED PUMP MOTOR SHALL BE REMOVED. ALL OTHER VALVES, PIPING, FITTINGS, PIPE SUPPORTS AND APPURTENANCES SHALL REMAIN.
2. EXISTING WELL PUMP CONCRETE BASE AND PAD, AND WELL CASING ARE TO REMAIN IN-PLACE AND INTACT. DAMAGE TO THE CONCRETE SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
3. ANY DAMAGE TO THE EXISTING CONCRETE SLAB AND/OR THE ABOVE GROUND PIPING THAT IS NOT TO BE REMOVED SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.
4. THE CONTRACTOR SHALL ENSURE THAT REMAINING PIPING AND VALVES THAT ARE LEFT OPEN DUE TO THE REMOVAL OF THE MOTOR AND CONNECTION APPURTENANCES SHALL BE TEMPORARILY CAPPED UNTIL THE NEW REPLACEMENT MOTOR AND APPURTENANCE IS CONNECTED.
5. SEE DWG C-101 FOR CIVIL REMOVAL.
6. SEE DWGS E-011 TO E-013 FOR ELECTRICAL REMOVAL.
7. THE DIMENSIONS AND LOCATIONS OF THE EXISTING PUMPING UNITS, VALVES, PIPING, FITTINGS, AND ALL ASSOCIATED COMPONENTS SHOWN ON THIS PLAN ARE APPROXIMATE AND WERE BASED ON AVAILABLE RECORD DRAWINGS AND SITE VISITS. THE CONTRACTOR SHALL FIELD VERIFY DIMENSIONS AND LOCATIONS OF THESE EXISTING PUMPING UNITS INCLUDING THEIR ASSOCIATED COMPONENTS PRIOR TO SUBMITTING PROPOSAL.
8. PAINT ALL EXISTING PIPING THAT WILL REMAIN AND NEW PIPING WITH KAUA'I GREEN.



EXISTING AND REMOVAL PUMP NO. 2 MOTOR PLAN
SCALE: 3/4" = 1'-0"



EXISTING AND REMOVAL PUMP NO. 2 MOTOR SECTION
SCALE: 3/4" = 1'-0"

EXISTING AND REMOVAL PUMP NO. 2 SECTION THRU WELL
SCALE: 1/2" = 1'-0"

<p>LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)</p> <p>REVISION DATE BY APPROVED</p>	<p>DEPARTMENT OF WATER COUNTY OF KAUA'I</p> <p>JOB NO. WKK-03</p> <p>MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2 KĪLAUEA, KAUA'I, HAWA'I'I</p>	
	<p>EXISTING PUMP PLAN AND SECTIONS</p> <p>DESIGNED BY AC DRAWN BY YN CHECKED BY GL</p> <p>APPROVED BY: <i>[Signature]</i> 3/11/19 MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUA'I</p>	
<p>GARETT D. Q. LEONG LICENSED PROFESSIONAL ENGINEER No. 10335-C HAWAII, U.S.A.</p> <p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 15-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.")</p> <p>BY <i>[Signature]</i> 4/30/20 EXP. DATE</p>	<p>SHEET 12 OF 60 SHEETS C-201</p>	

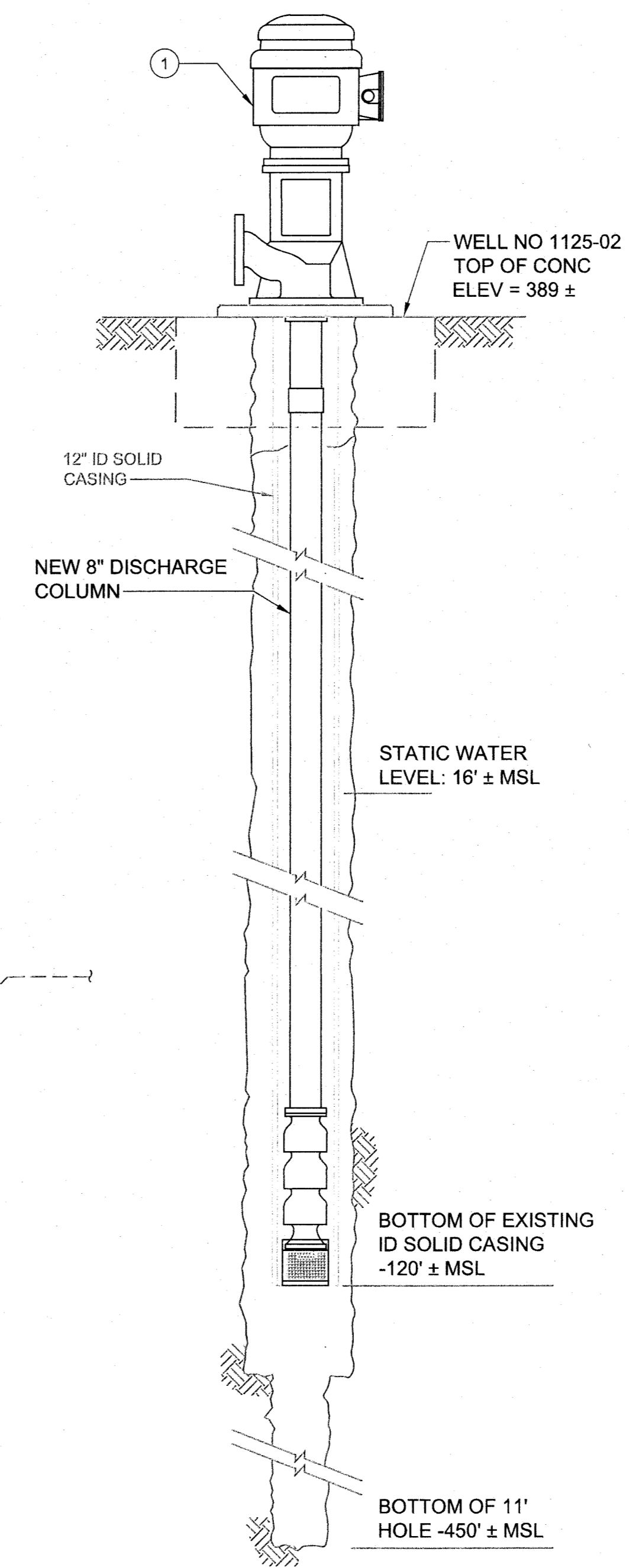
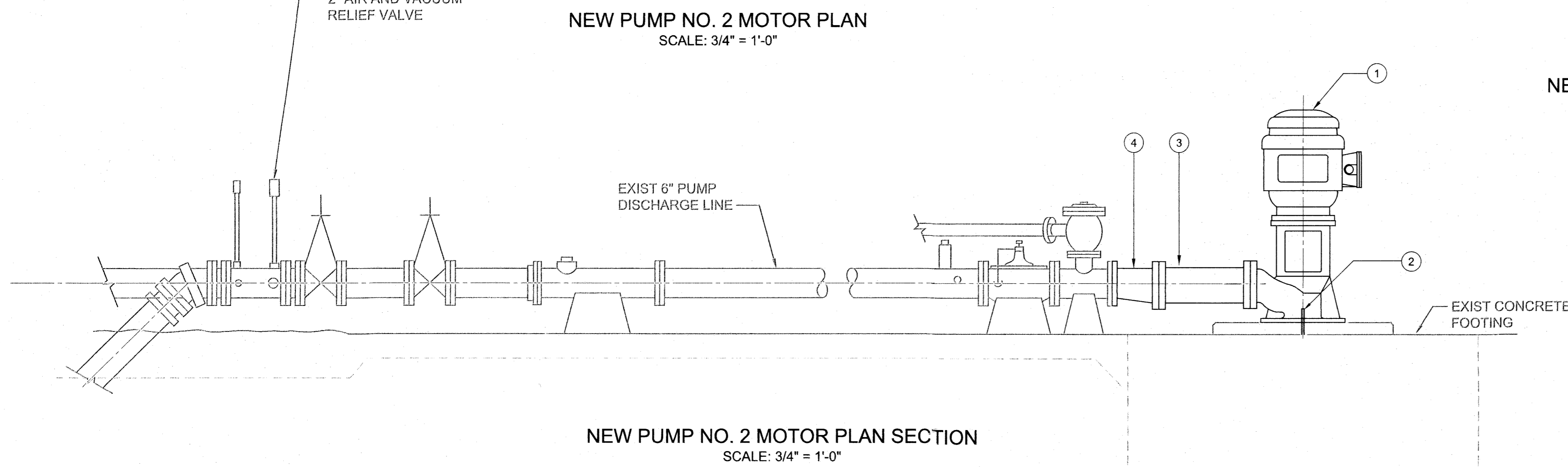
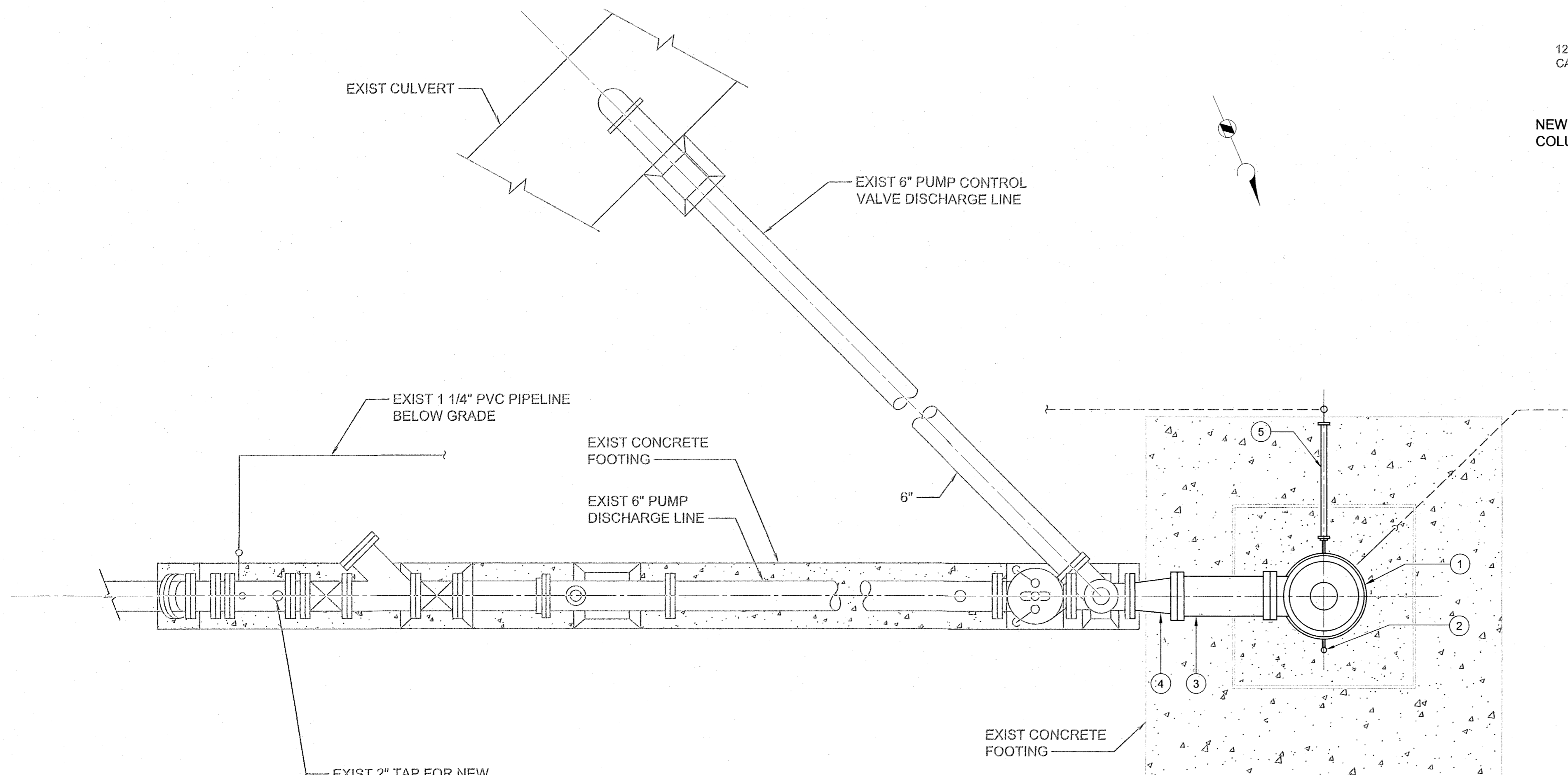
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KEY NOTES

- ① NEW 125 HP PUMP MOTOR
- ② 1" TAP BETWEEN CASING & DISCHARGE COLUMN FOR AIR & VACUUM RELIEF VALVE. RECONNECT TO NEW PUMP AND MOTOR ASSEMBLY PER MFR RECOMMENDATIONS
- ③ NEW 8" FLANGE COUPLING ADAPTER (CONFIRM SIZE WITH PUMP MFR)
- ④ NEW 8"x6" ECCENTRIC REDUCER (CONFIRM SIZE WITH PUMP MFR)
- ⑤ PRELUBE LINE: DISCONNECT DURING PUMP AND MOTOR REMOVAL, AND RECONNECT TO NEW PUMP AND MOTOR ASSEMBLY PER MFR RECOMMENDATIONS.

NOTES:

- 1. UNLESS OTHERWISE SPECIFIED, THE NEW PUMP, MOTOR, FITTINGS, AND ALL APPURTENANCES SHALL BE INSTALLED ACCORDING TO THEIR MANUFACTURERS' OR DISTRIBUTORS' RECOMMENDATIONS.
- 2. SEE ELECTRICAL DRAWINGS FOR DETAILS OF THE ELECTRICAL CONDUIT CONNECTIONS.
- 3. THE CONTRACTOR SHALL MAKE NECESSARY ADJUSTMENTS WHEN INSTALLING THE NEW PUMP SURFACE PLATE AND SOLE PLATE ONTO THE EXISTING CONCRETE PUMP BASE AND WELL CASING PER MANUFACTURER'S INSTALLATION INSTRUCTIONS. LAYOUT AND DIMENSIONS OF NEW PIPING AND FITTINGS WERE DESIGNED TO MATCH THE NEW PUMPING UNIT (LINESHAFT TURBINE PUMP, MODEL 10JRCH (12 STAGE) AND THE NEW PUMP MOTOR UNIT, US MOTOR VHS 125 HP MODEL FA51, MANUFACTURED BY GICON PUMPS OR APPROVED EQUAL. THE CONTRACTOR SHALL MAKE NECESSARY ADJUSTMENTS TO THE LAYOUT AND DIMENSIONS OF THE NEW PUMPING UNIT AS NEEDED AND ADJUSTMENTS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER IF OTHER TYPES OF PUMPING UNITS ARE FURNISHED. SEE SPECIAL PROVISIONS FOR DETAILED SPECIFICATIONS OF THE NEW PUMPING UNITS AND THEIR ASSOCIATED COMPONENTS.



PUMP SCHEDULE	
DESCRIPTION	VALUES
NUMBER REQUIRED	1
PUMP RATED CAPACITY AND HEAD	700 GPM AT 470 FT TDH
MAXIMUM SHUTOFF HEAD	696 FT
MODEL	LINESHAFT TURBINE PUMP, MODEL 10JRCH (12 STAGE) AND THE NEW PUMP MOTOR UNIT, US MOTOR VHS 125 HP MODEL FA51, MANUFACTURED BY GICON PUMPS OR APPROVED EQUAL
RATED PUMP SPEED	1,800 RPM
TOTAL PUMP COLUMN LENGTH	500 +/- FT

MOTOR SCHEDULE	
DESCRIPTION	VALUES
NUMBERED REQUIRED	1
HORSE POWER RATING	125 HP
POWER	460 VOLTS, 3 PHASE, 60 HERTZ
MAXIMUM SPEED OF MOTOR	4 POLE (1,800 RPM)
MOTOR SERVICE FACTOR	1.15
CONFIGURATION AND OPTIONS	VERTICAL, CENTRIFUGAL MOTOR

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

REVISION DATE BRKF BY APPROVED

GARRETT D. Q. LEONG
LICENSED PROFESSIONAL ENGINEER
No. 10335-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.")

BY: *[Signature]* 4/30/20 EXP DATE

DEPARTMENT OF WATER
COUNTY OF KAUAI
JOB NO. WKK-03
MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII

PUMP PLAN AND SECTIONS

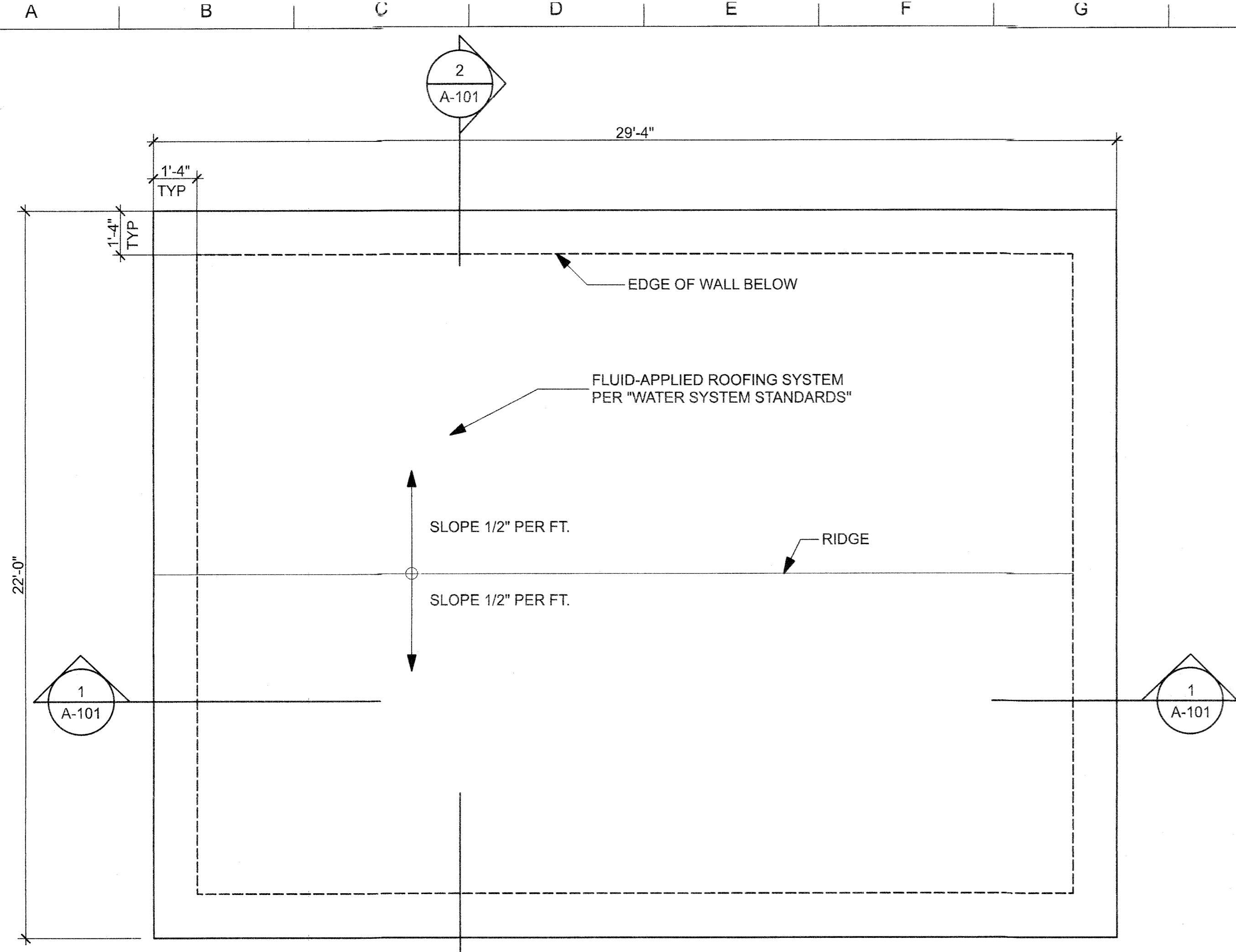
DESIGNED BY: AC DRAWN BY: YN CHECKED BY: GL

APPROVED BY: *[Signature]* 3/11/19 DATE
MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI

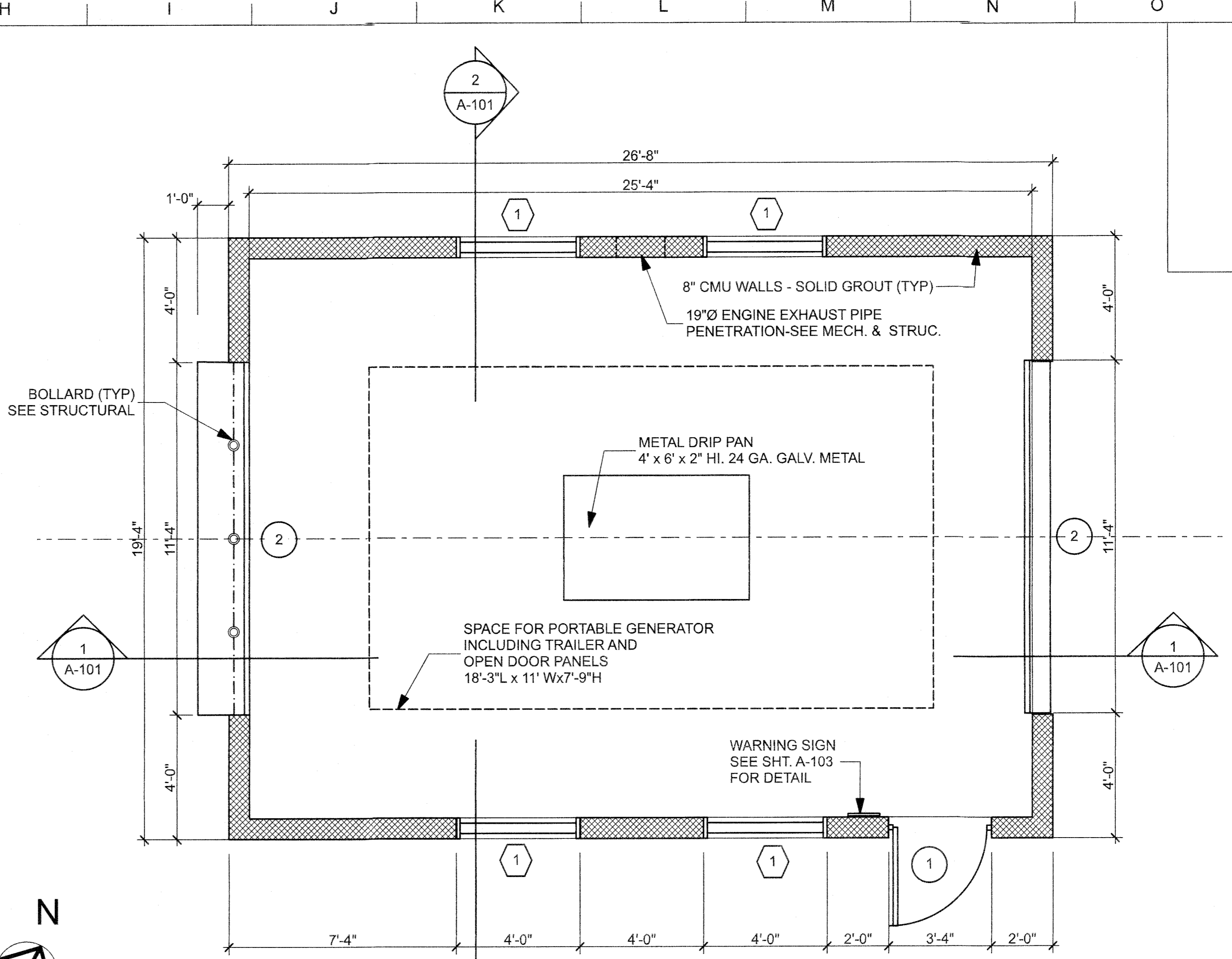
SHEET 13 OF 60 SHEETS C-202

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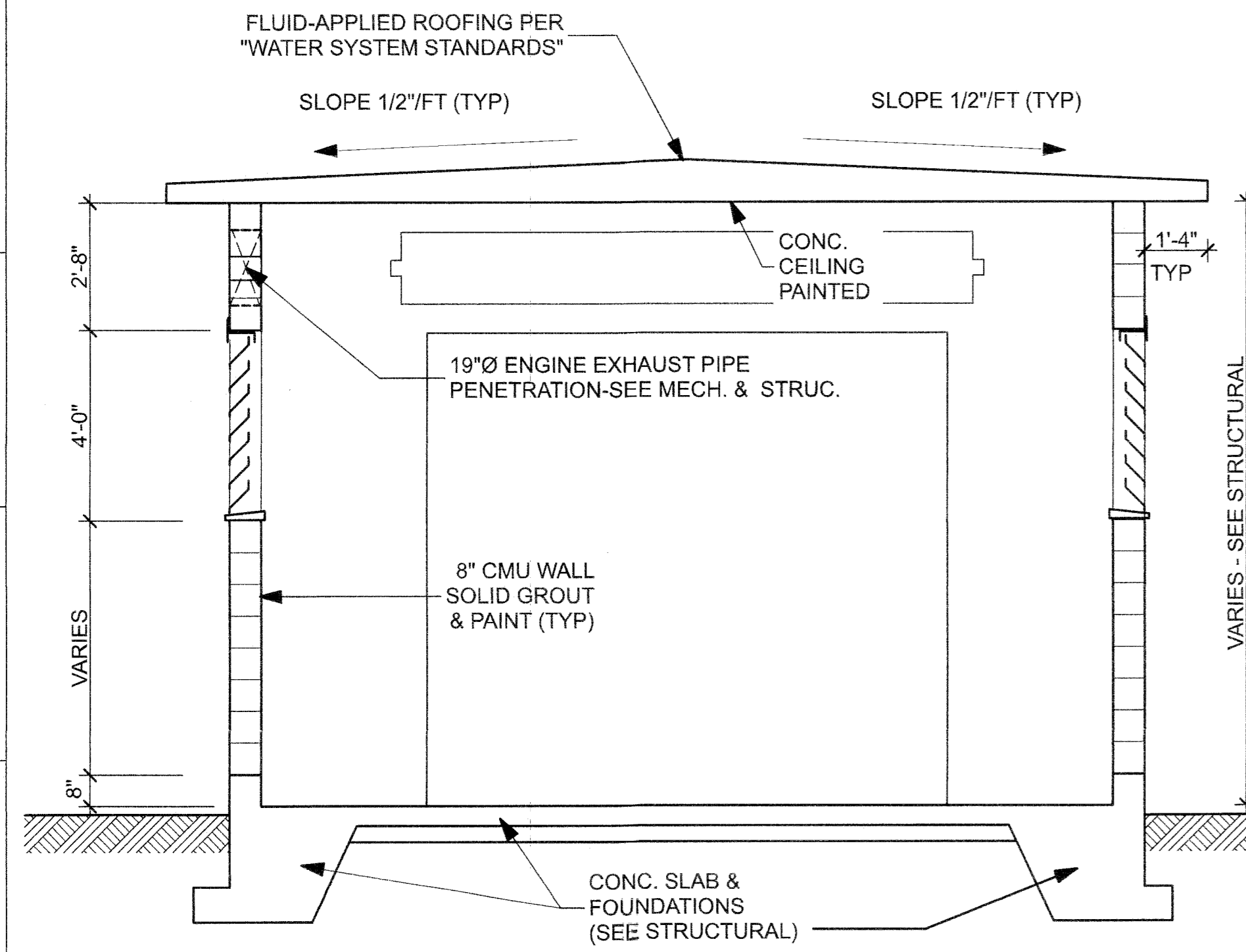
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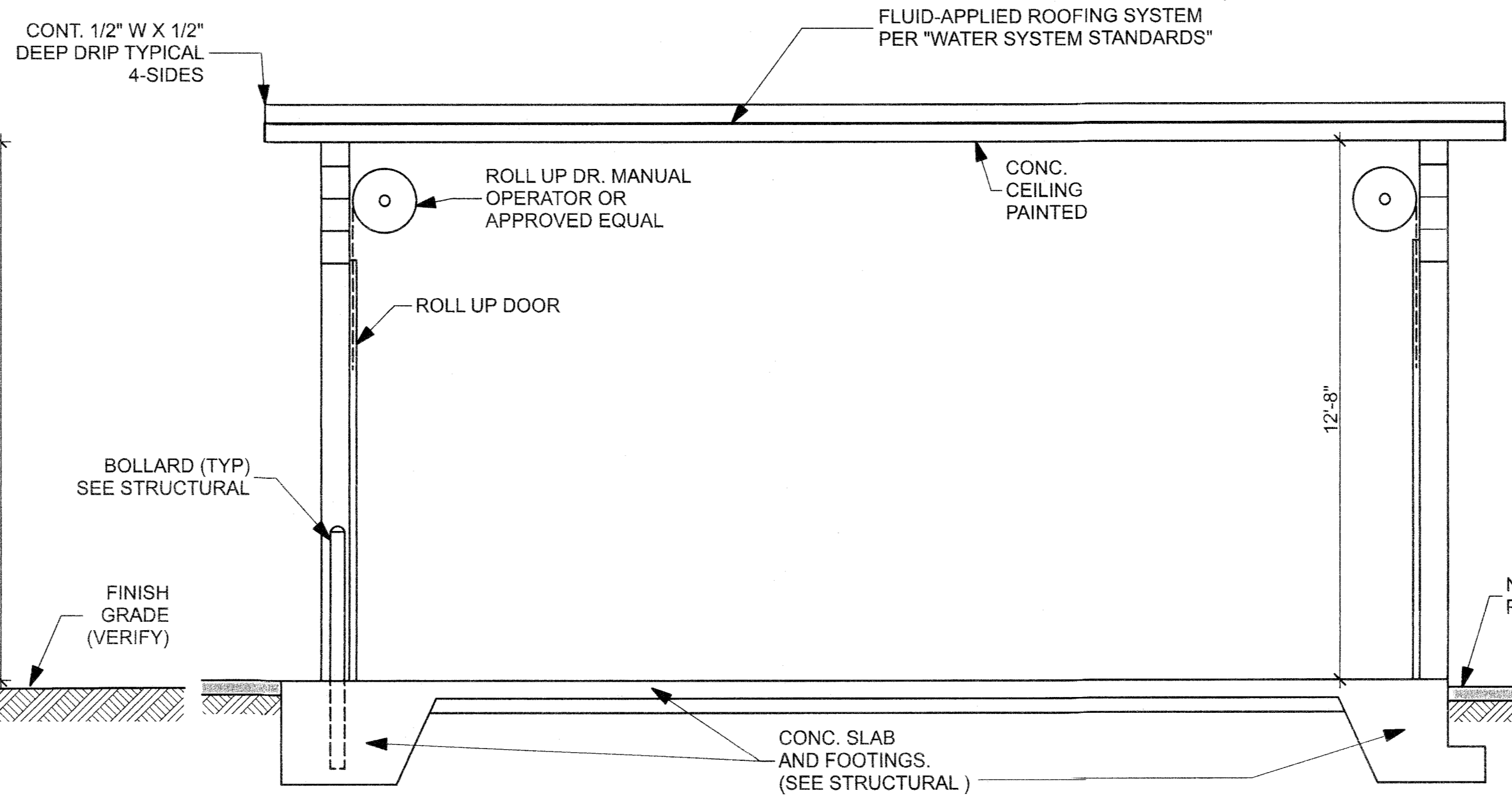
KILAUEA WELLS NEW GENERATOR SHELTER
ROOF PLAN
SCALE: 3/8" = 1'- 0"



KILAUEA WELLS NEW GENERATOR SHELTER
FLOOR PLAN
SCALE: 3/8" = 1'- 0"



2 KILAUEA WELLS NEW GENERATOR SHELTER
CROSS SECTION
SCALE: 3/8" = 1'- 0"

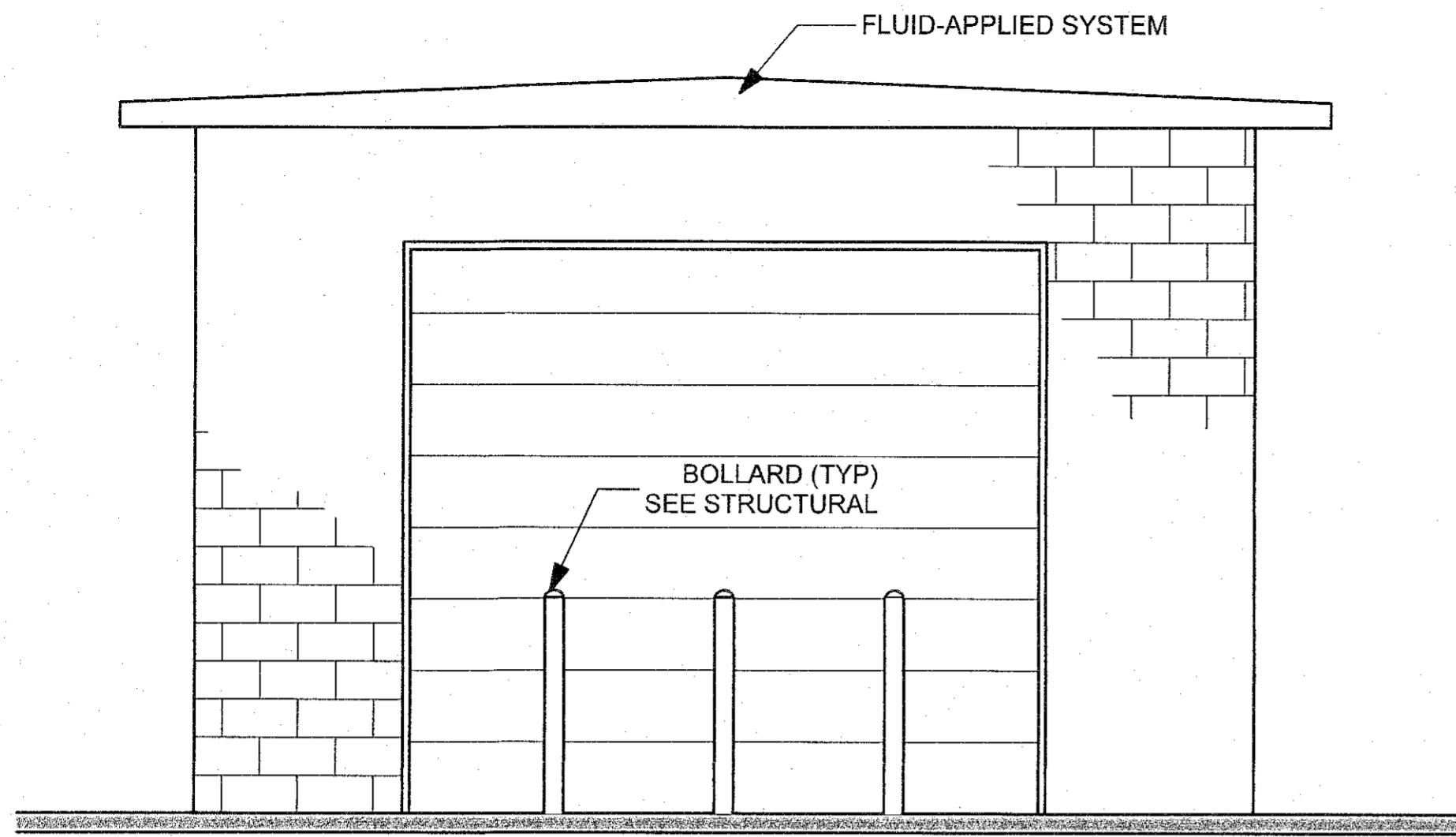


1 KILAUEA WELLS NEW GENERATOR SHELTER
LONGITUDINAL SECTION
SCALE: 3/8" = 1'- 0"

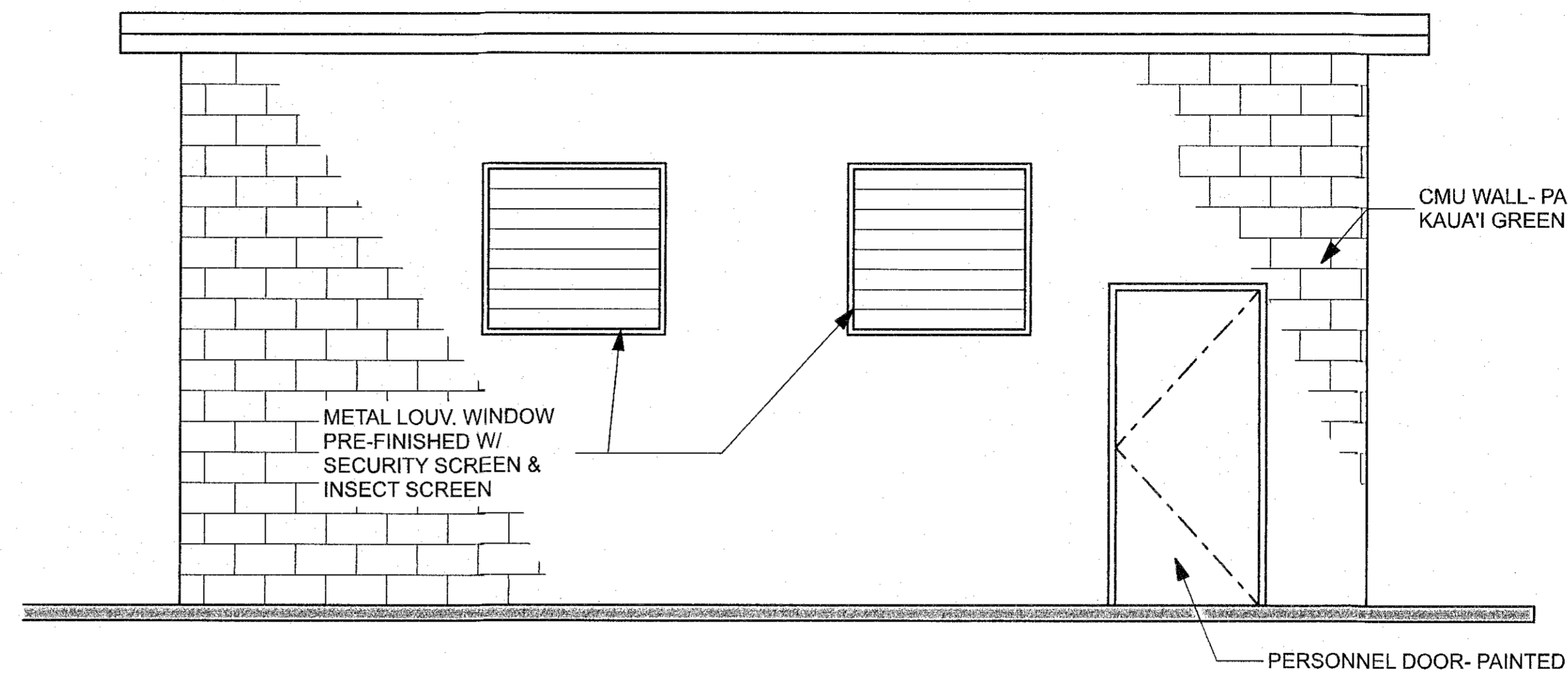
CODE NOTES:
1. OCCUPANCY TYPE: U
2. CONSTRUCTION TYPE: IIB

<p>LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)</p> <p>PAUL F. MORGAN LICENSED PROFESSIONAL ARCHITECT No. 5575 HAWAII, USA</p> <p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.)</p> <p>APPROVED BY: <i>Paul F. Morgan</i> DATE: 4/30/18 EXP DATE:</p>	<p>REVISION</p> <p>DATE</p> <p>BREF</p> <p>BY</p> <p>APPROVED</p>	<p>DEPARTMENT OF WATER</p> <p>COUNTY OF KAUAI</p> <p>JOB NO. WKK-03</p> <p>MCC, CHLORINATION FACILITIES -</p> <p>KILAUEA WELLS NO. 1 AND NO. 2</p> <p>KILAUEA, KAUA'I, HAWAII</p> <p>GENERATOR SHELTER PLANS AND BUILDING SECTIONS</p> <p>DESIGNED BY: _____ DRAWN BY: _____ CHECKED BY: _____</p> <p>APPROVED BY: <i>Paul F. Morgan</i> DATE: 3/11/19</p>
	<p>SHEET 14 OF 55 SHEETS</p> <p>A-101</p>	<p>NEW PAVEMENT</p>

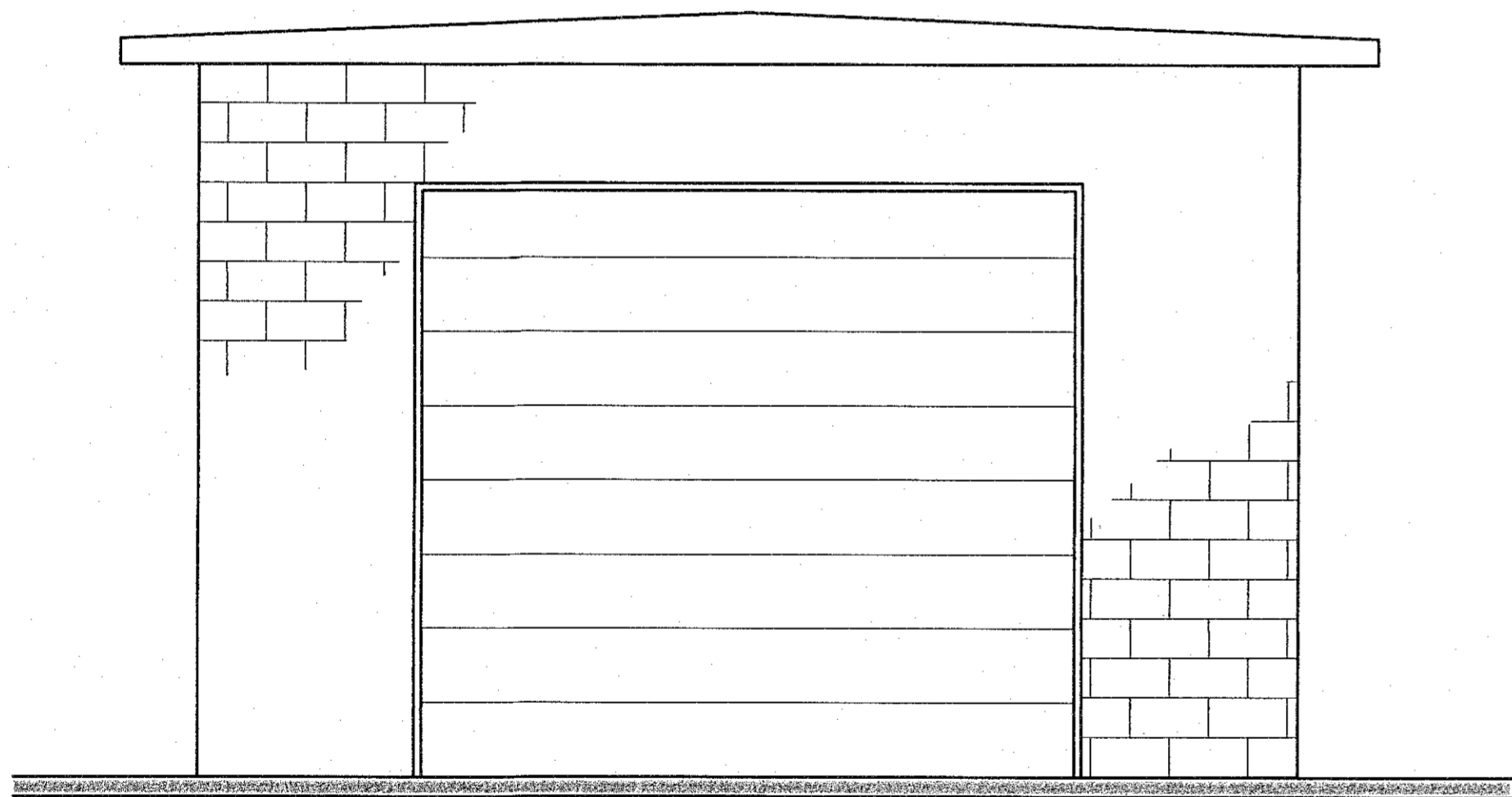
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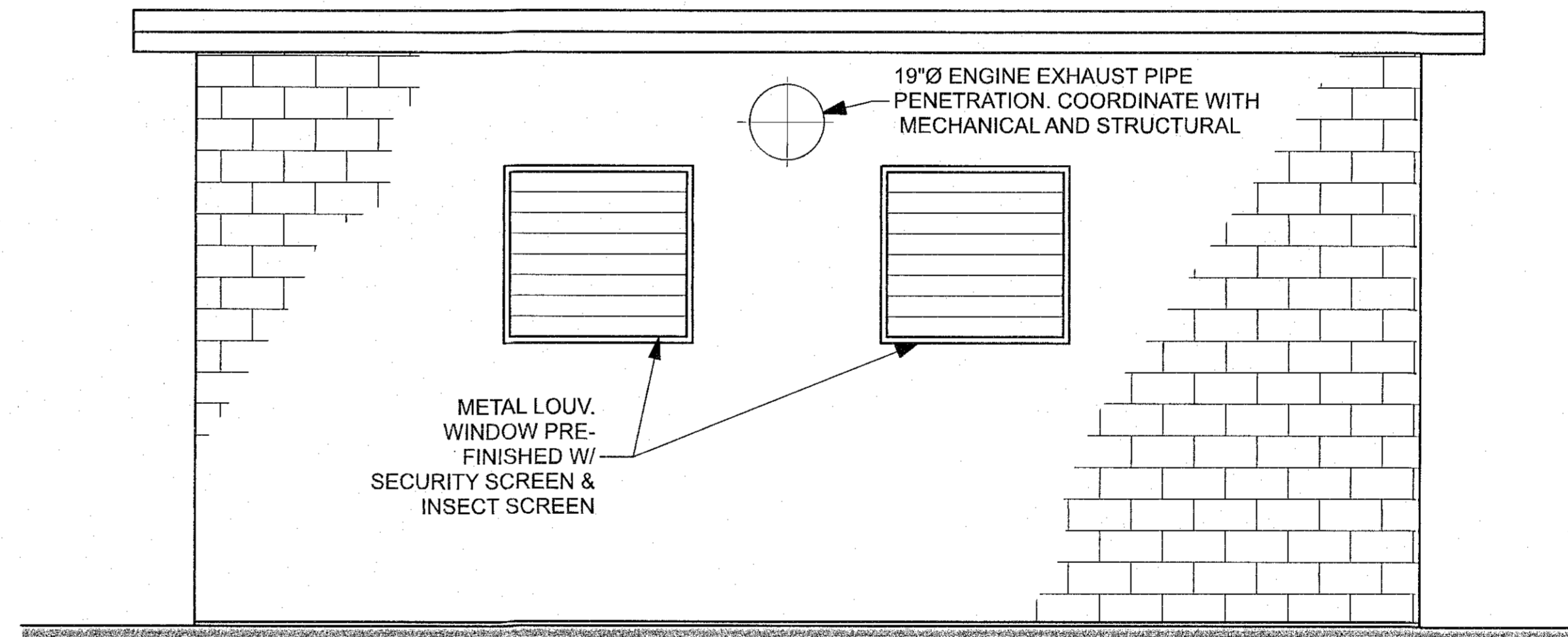
KILAUEA WELLS NEW GENERATOR SHELTER
REAR ELEVATION
SCALE: 3/8" = 1'- 0"



KILAUEA WELLS NEW GENERATOR SHELTER
LEFT ELEVATION
SCALE: 3/8" = 1'- 0"



KILAUEA WELLS NEW GENERATOR SHELTER
FRONT ELEVATION
SCALE: 3/8" = 1'- 0"



KILAUEA WELLS NEW GENERATOR SHELTER
RIGHT ELEVATION
SCALE: 3/8" = 1'- 0"

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

REVISION	DATE	BY	APPROVED

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DEPARTMENT OF WATER
 COUNTY OF KAUAI
 JOB NO. WKK-03
MCC, CHLORINATION FACILITIES -
KILAUEA WELLS NO. 1 AND NO. 2
 KILAUEA, KAUAI, HAWAII

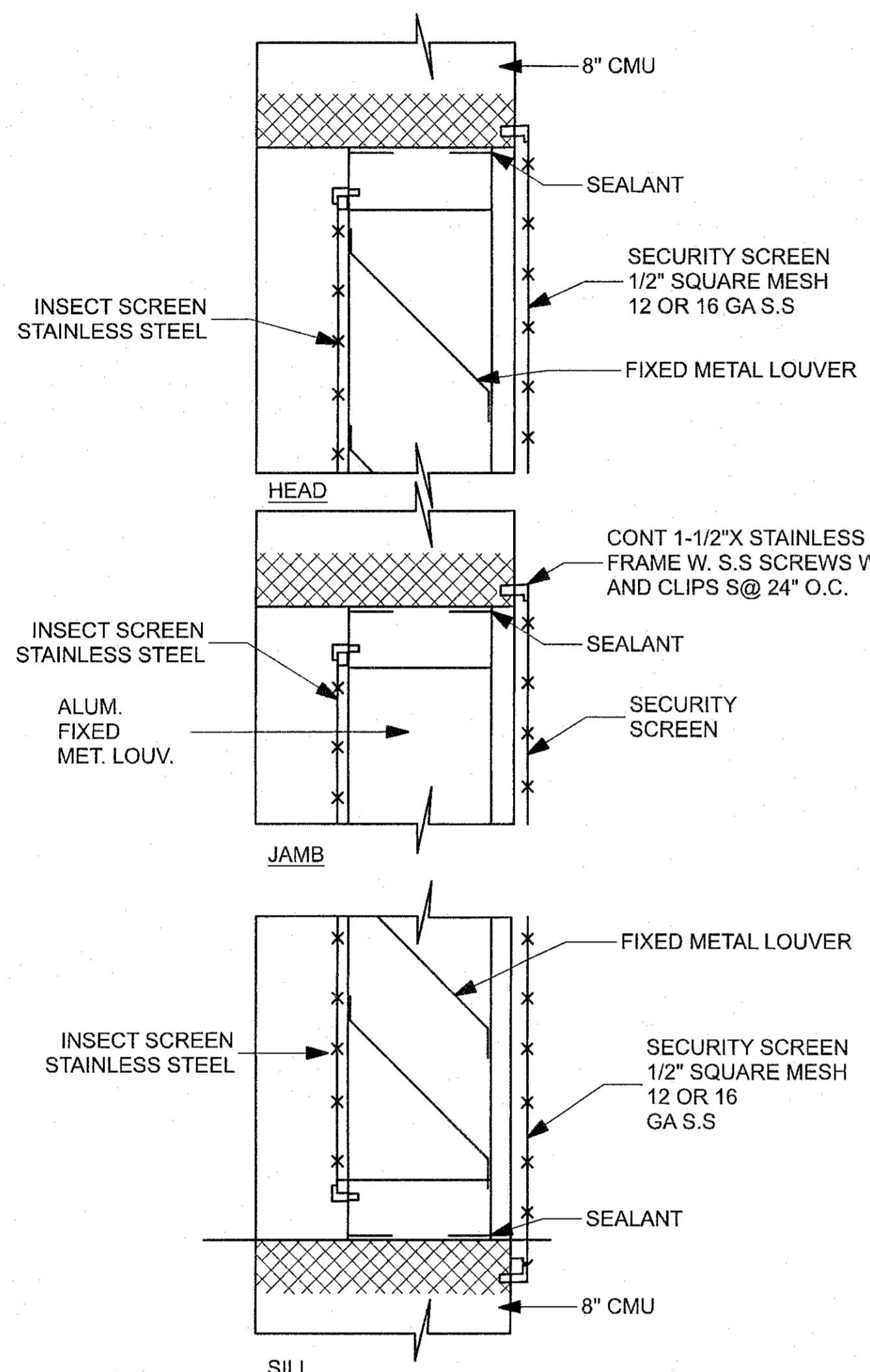
DESIGNED BY: PFM DRAWN BY: PDC/PEM CHECKED BY: PFM
 APPROVED BY: DATE: 3/11/19
MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI

SHEET 15 OF 60 SHEETS A-102

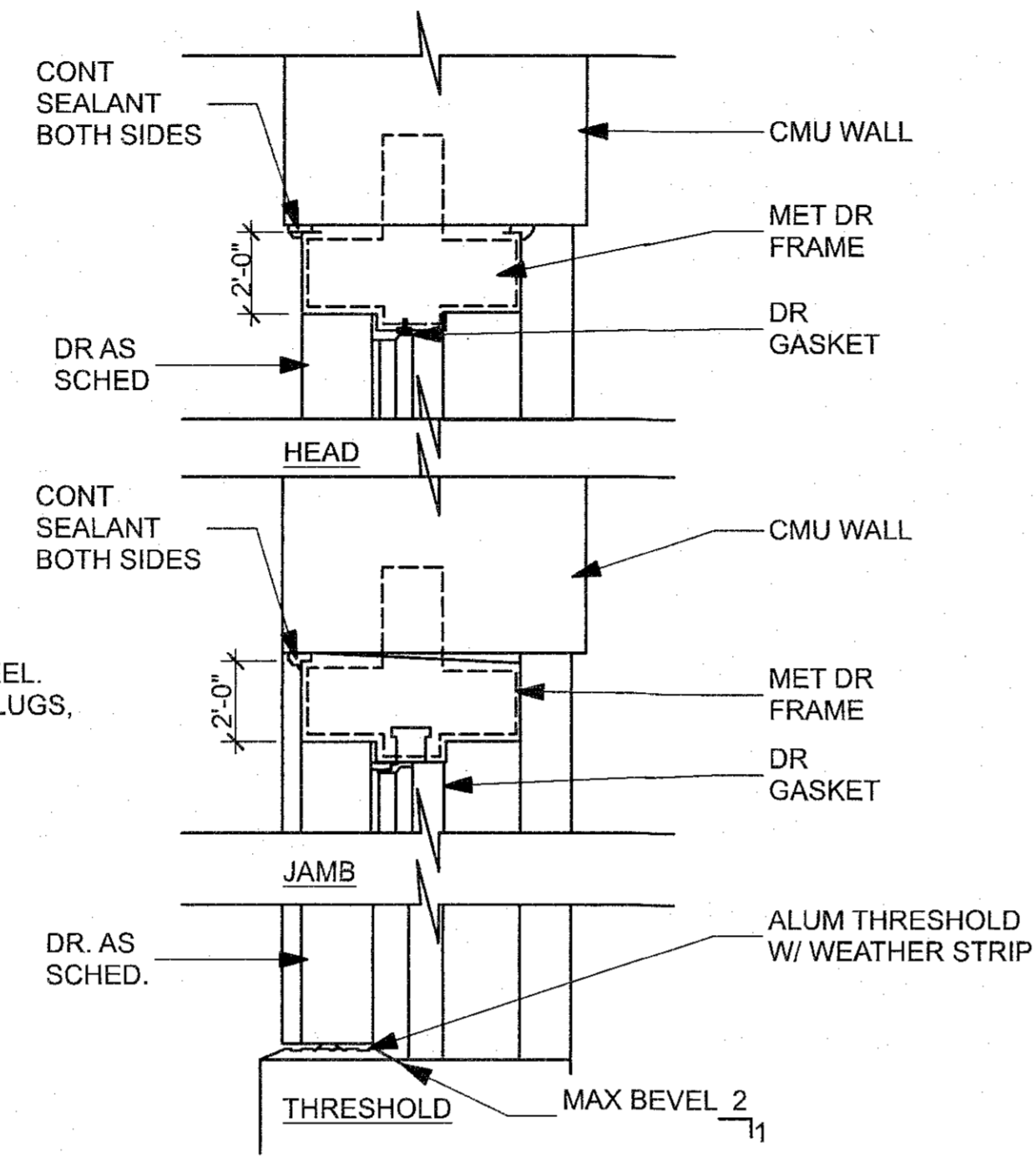
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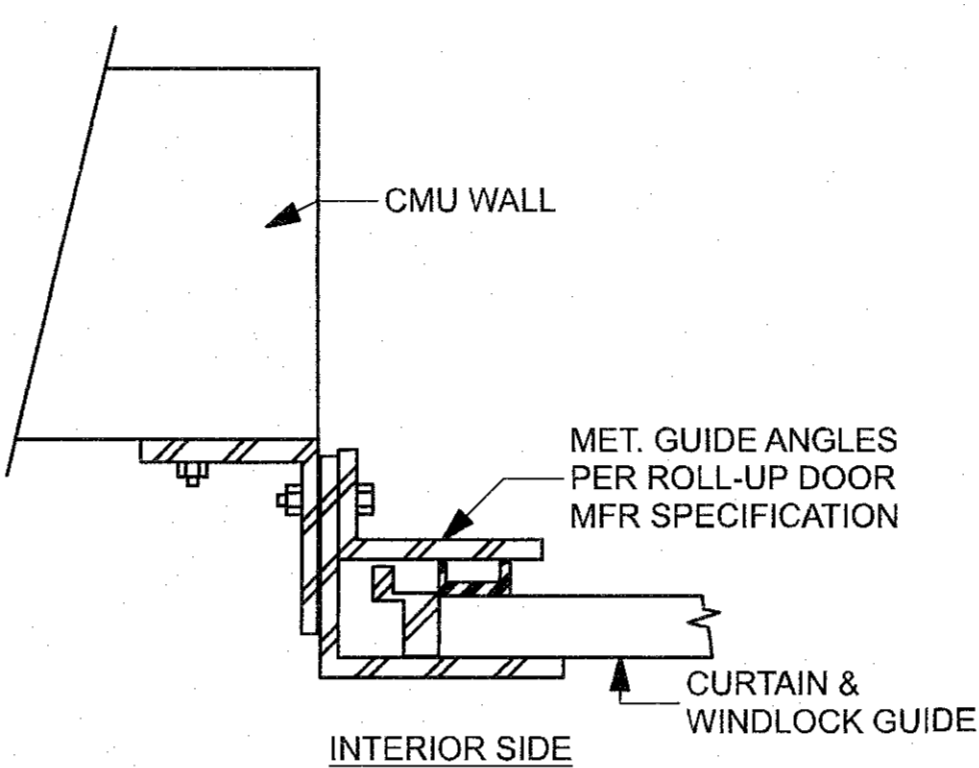
10
9
8
7
6
5
4
3
2
1



KILAUEA WELLS NEW GENERATOR SHELTER
LOUVER DETAILS
SCALE: 3" = 1'-0"



KILAUEA WELLS NEW GENERATOR SHELTER
PERSONNEL DOOR DETAILS
SCALE: 3" = 1'-0"

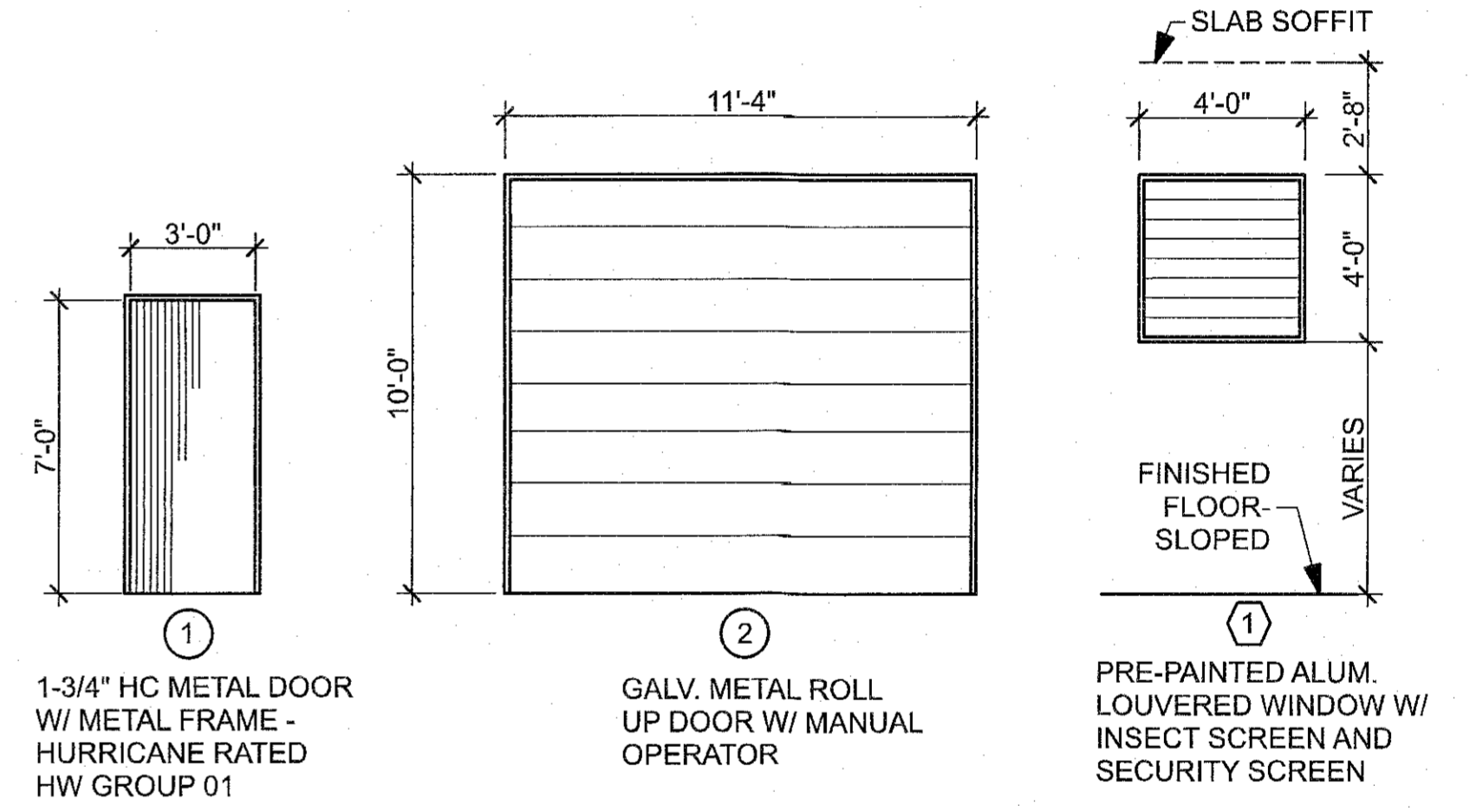


KILAUEA WELLS NEW GENERATOR SHELTER
COILING DOOR DETAIL
SCALE: 3" = 1'-0"

WARNING
ROLL UP DOOR MUST REMAIN OPEN WHEN OPERATING GENERATOR

- NOTE:**
- SIGN SHALL BE 0.080" ALUMINUM PLATE.
 - COLOR SHALL BE OPAQUE GLOSSY. SAMPLES AS SPECIFIED IN TABLE OF SAFETY COLORS FOR CIE STANDARD SOURCE "O" AMERICAN NATIONAL STANDARDS 258.1 & OSHA.
 - SEE SHEET A-101 FOR LOCATION.

KILAUEA WELLS NEW GENERATOR SHELTER
WARNING SIGN DETAIL
SCALE: NTS



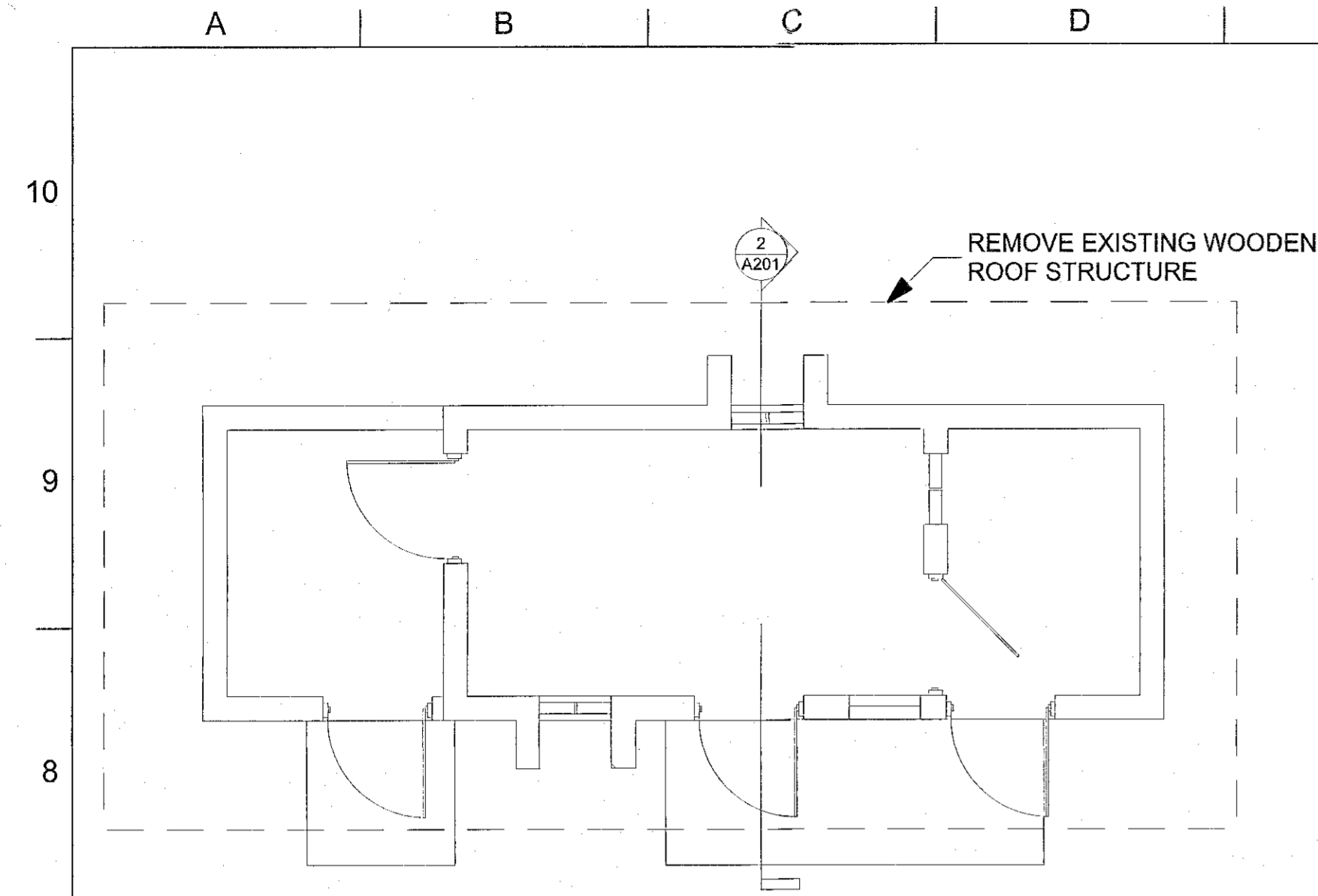
NOTE: ALL DOORS AND WINDOWS/LOUVERS MUST BE RATED TO WITHSTAND HURRICANE CATEGORY 5 WINDS. POUNDS PER SQUARE FOOT (PSF) RATING = +/- 130 PSF

KILAUEA WELLS NEW GENERATOR SHELTER
DOOR & WINDOW SCHEDULE
SCALE: 1/4" = 1'-0"

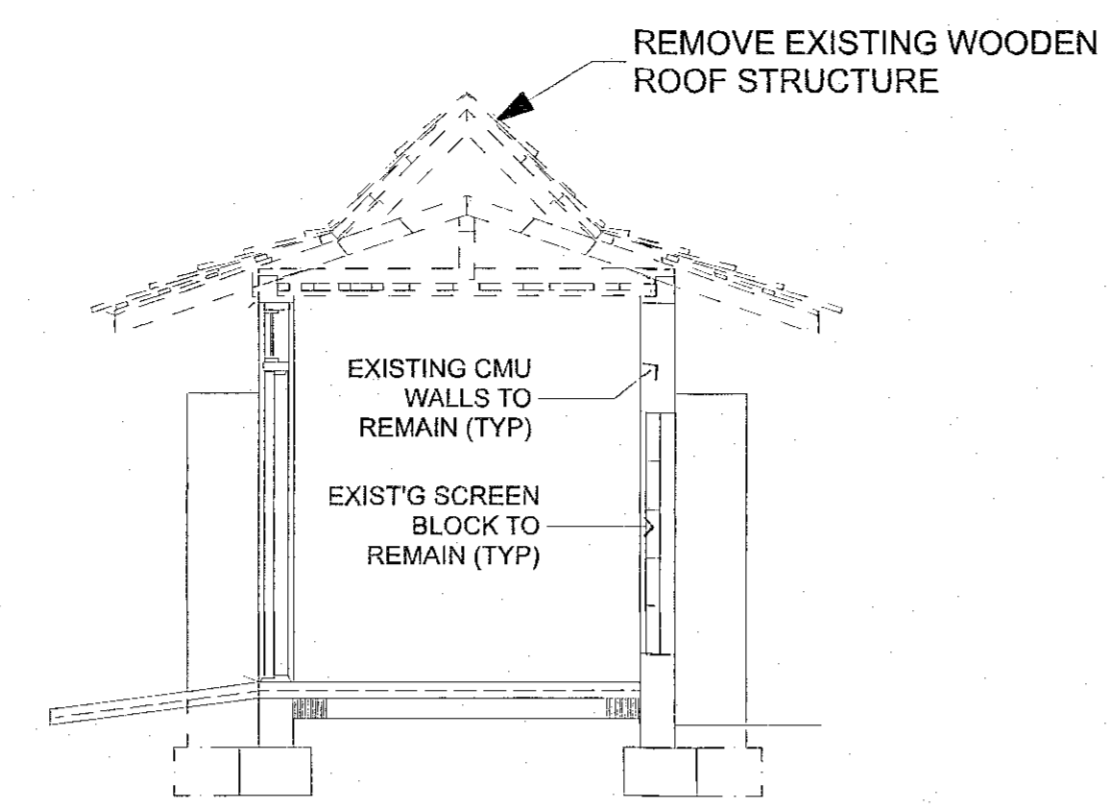
LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)	REVISION	DATE	BRIEF	BY	APPROVED
	DEPARTMENT OF WATER COUNTY OF KAUAI				
	JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII				
	GENERATOR SHELTER SCHEDULES AND DETAILS				
	DESIGNED BY: PFM		DRAWN BY: PDC/PPM		CHECKED BY: PFM
APPROVED BY: <i>[Signature]</i> 3/11/19 <small>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</small>					
SHEET 16 OF 60 SHEETS A-103					

PAUL F. MORGAN
 LICENSED PROFESSIONAL ARCHITECT
 No. 5575
 HAWAII, USA
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 BY: *Paul F. Morgan* 4/30/20
EXP. DATE

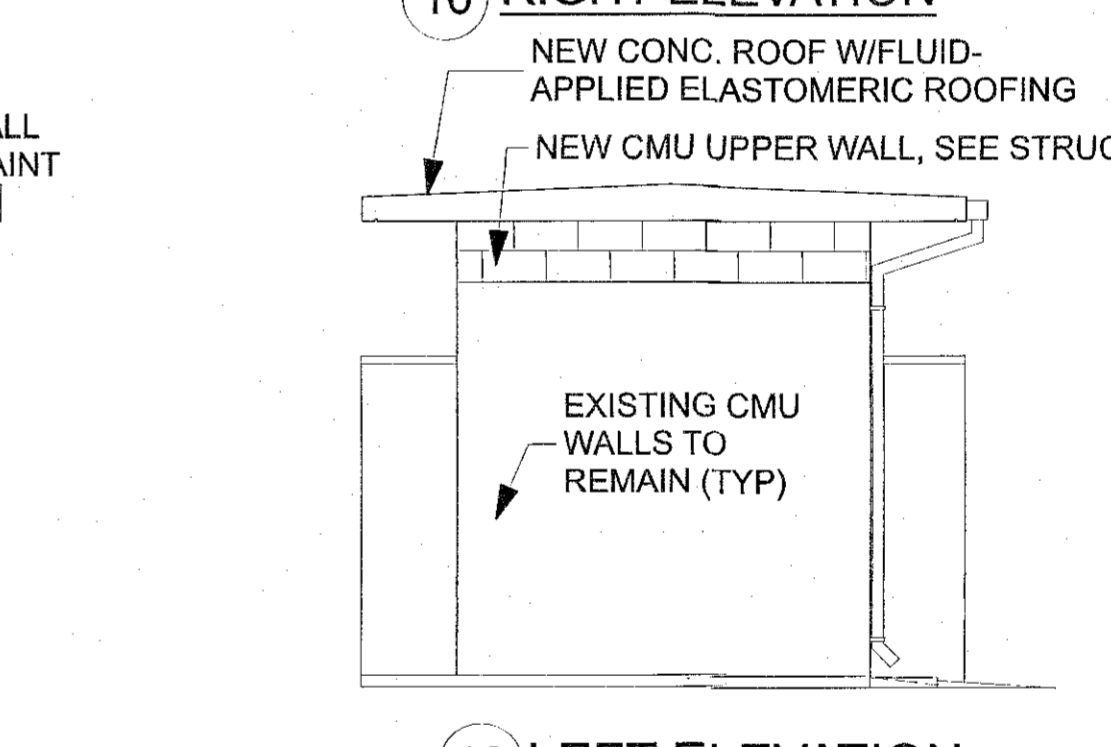
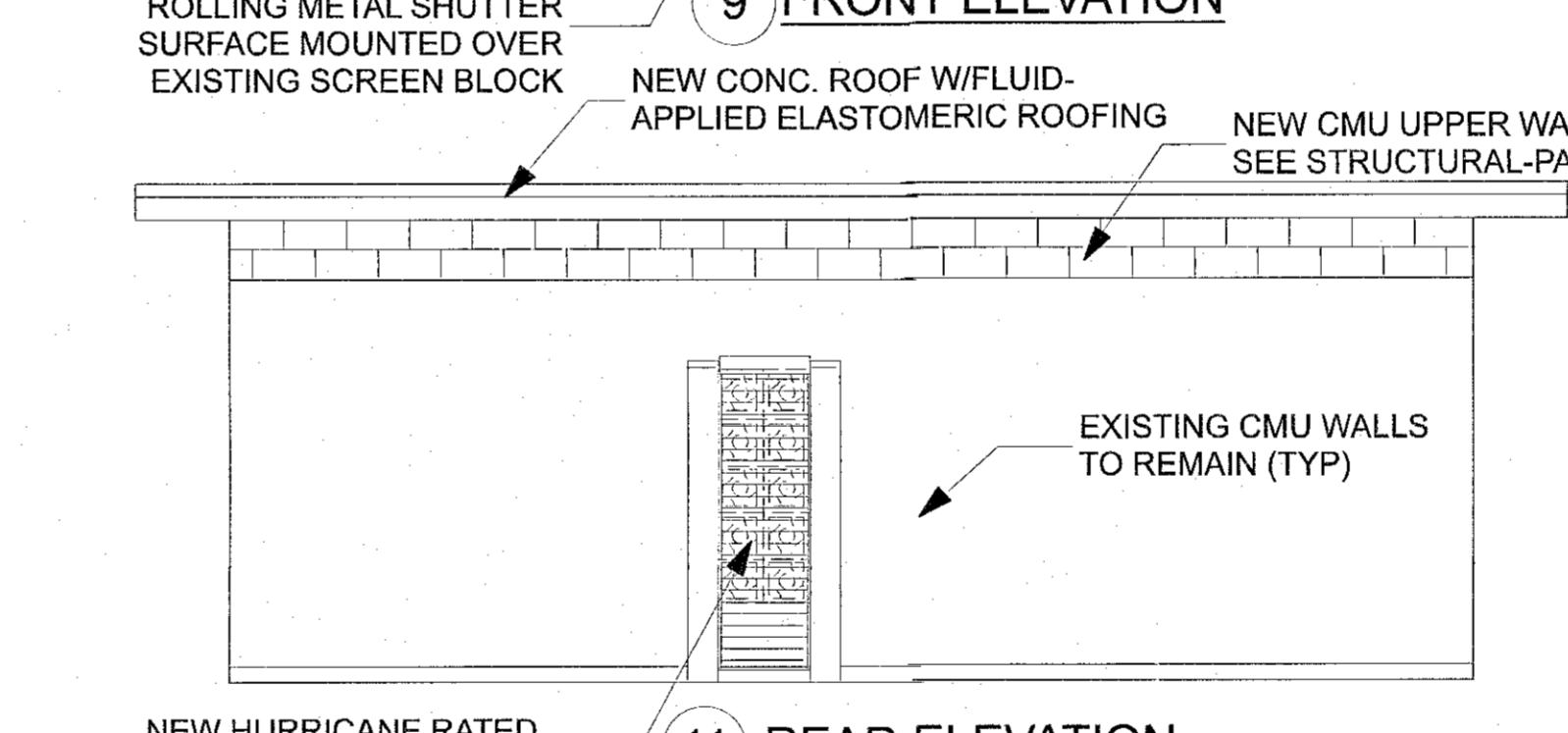
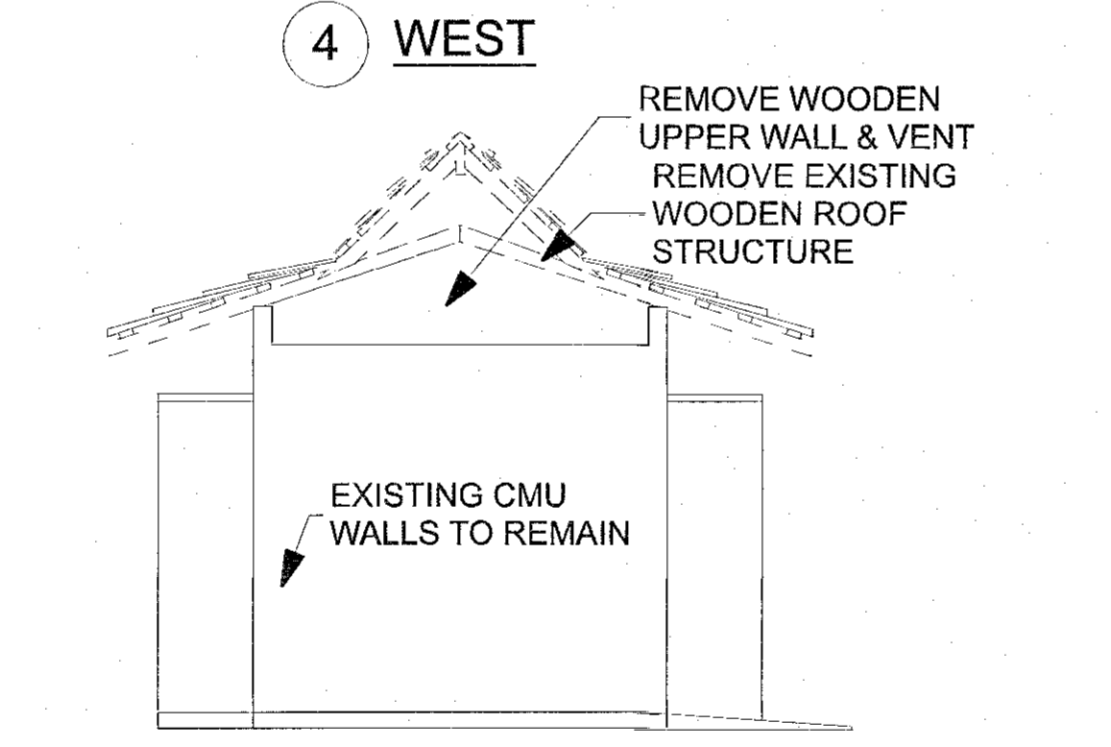
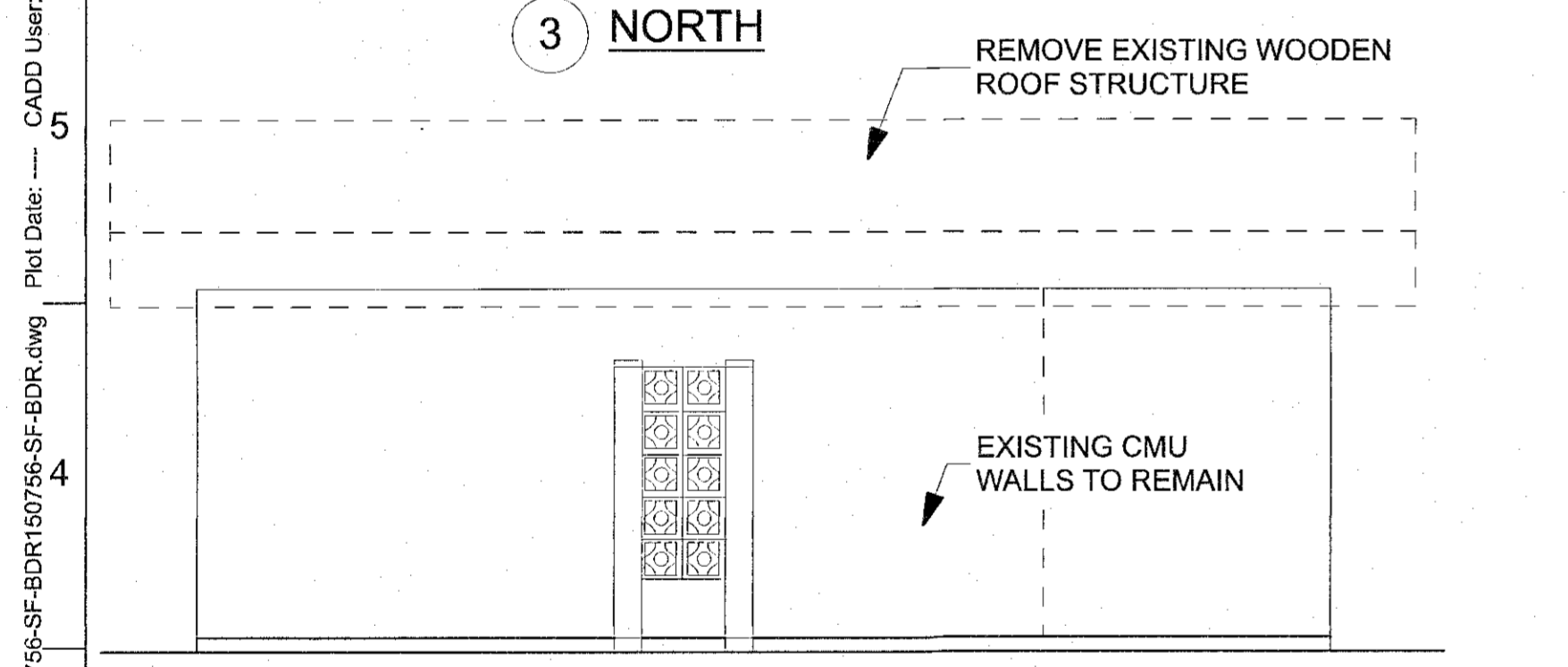
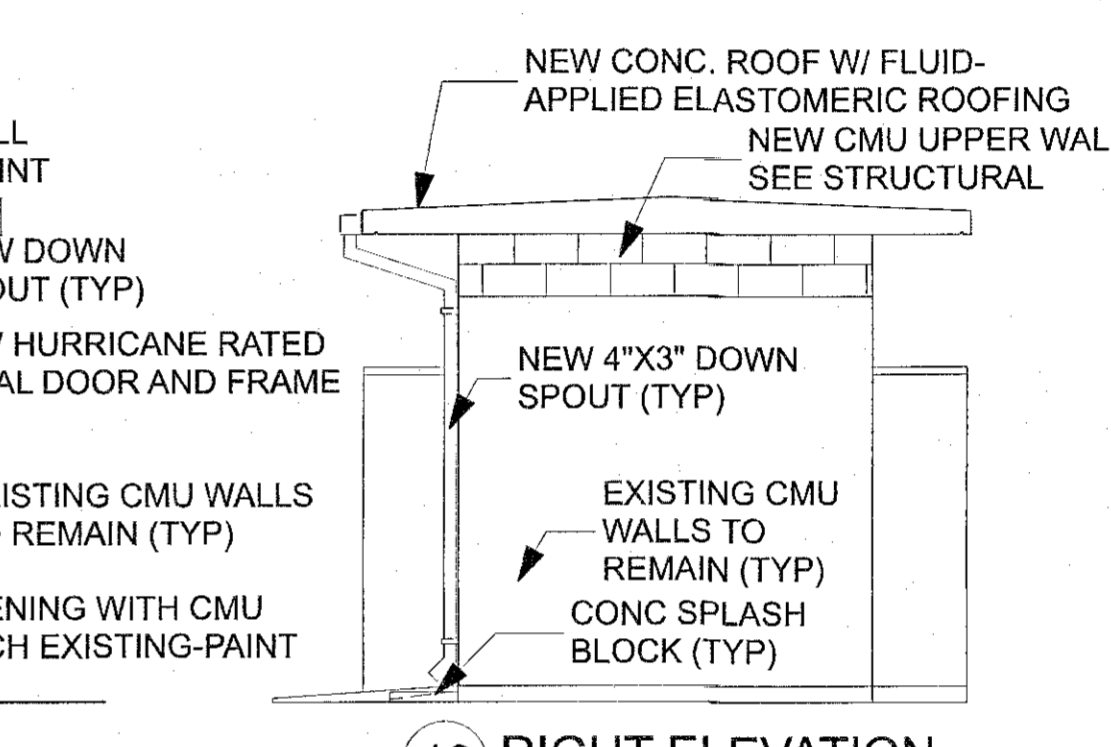
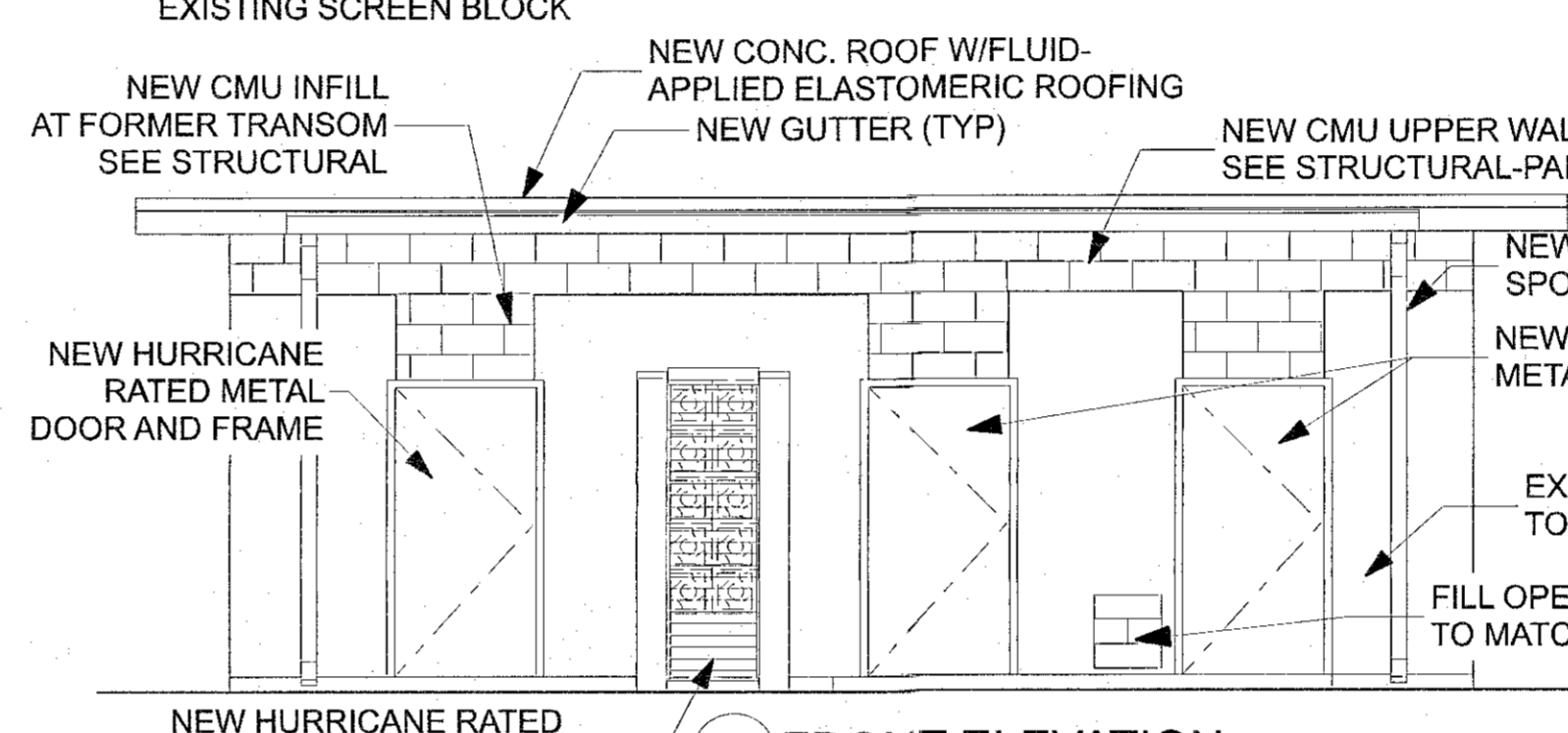
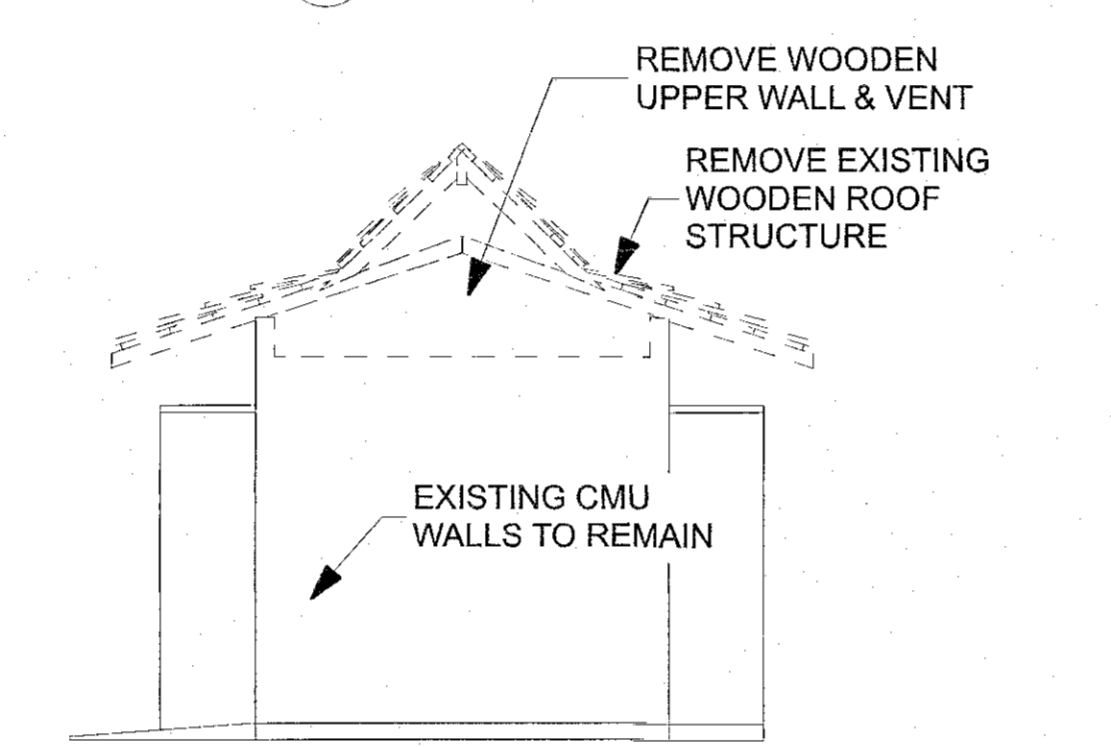
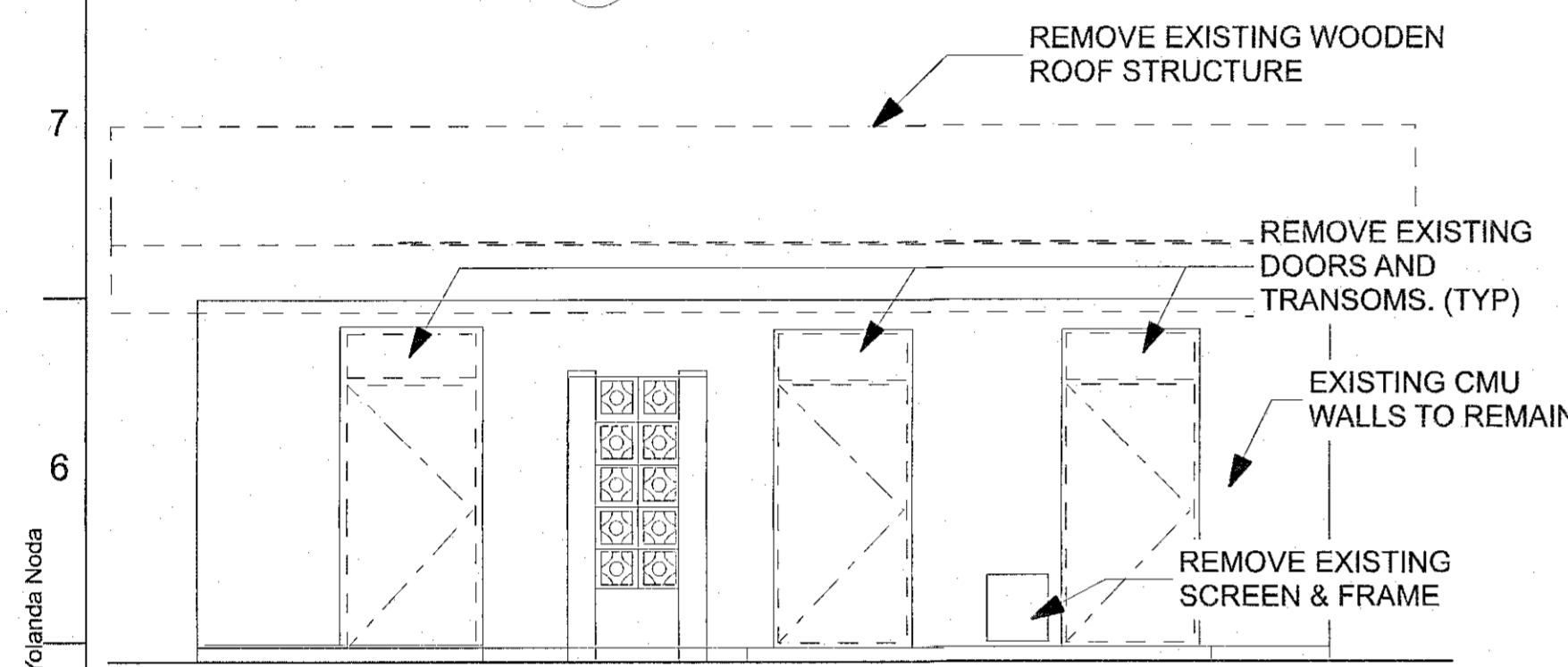
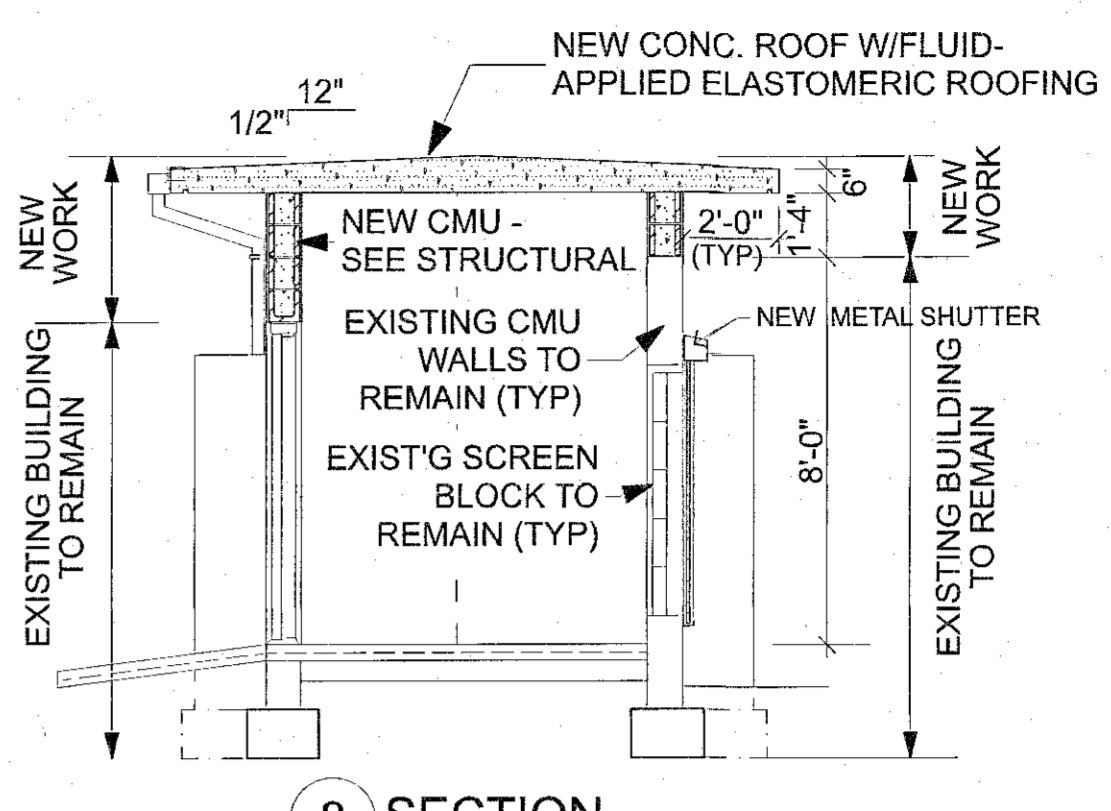
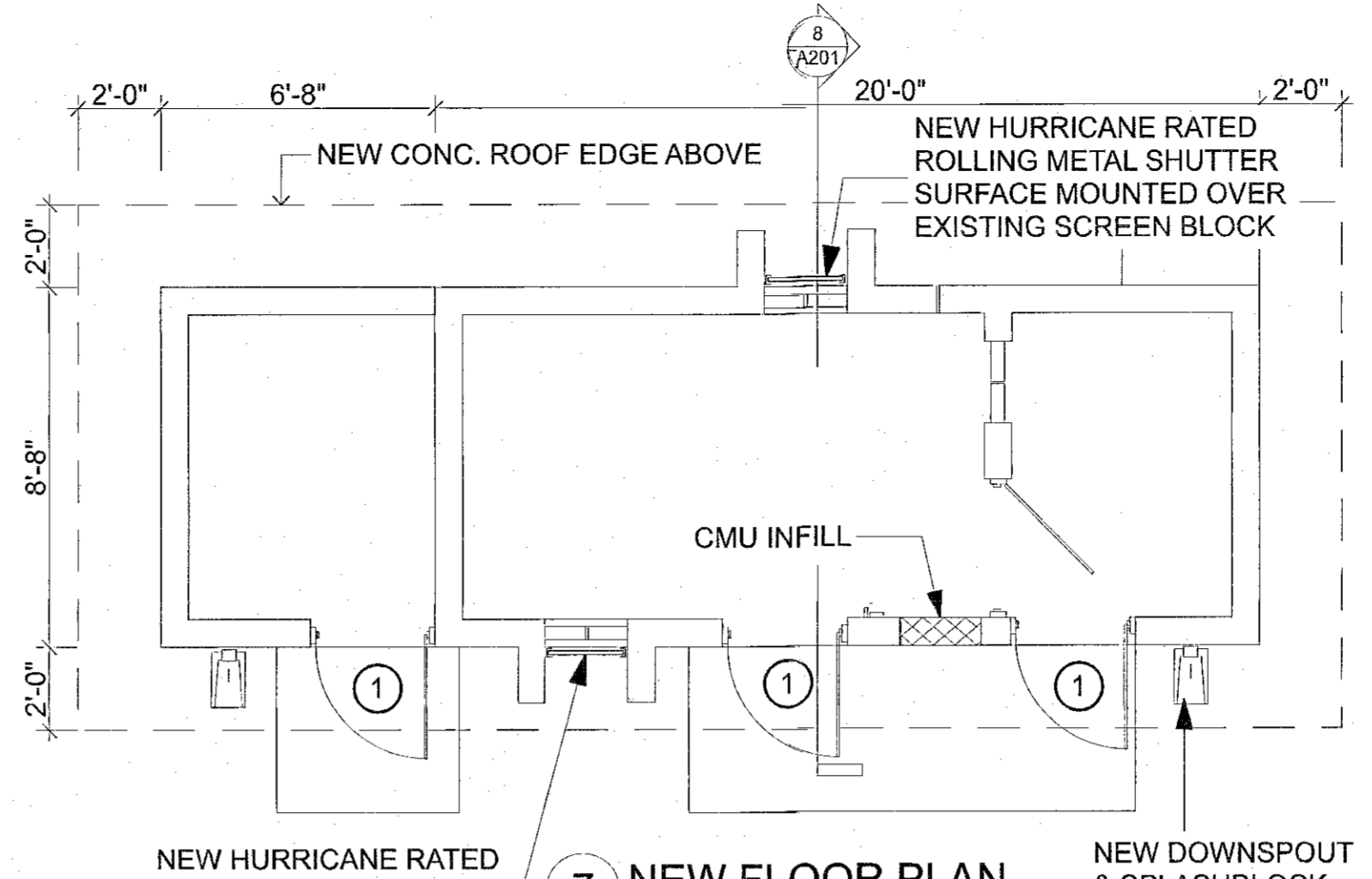
A B C D E F G H I J K L M N O P



1 DEMOLITION FLOOR PLAN



2 SECTION



EXISTING PUMP CONTROL BUILDING
DEMOLITION DRAWINGS
SCALE: 1/4" = 1'-0"

EXISTING PUMP CONTROL BUILDING
RENOVATION DRAWINGS
SCALE: 1/4" = 1'-0"

GENERAL NOTES:

- GUTTER AND DOWNSPOUTS TO BE ALUMINUM 4" X 3" PROFILE
- HURRICANE SHUTTERS TO BE "TUSCON ROLLING SHUTTER" W/ 5MM HEAVY DUTY EXTRUDED SLATS IN 5MM GUIDE RAIL; ELECTRONIC REMOTE CONTROL WITH CRANK HANDLE OVERRIDE, OR APPROVED EQUAL.
- PAINT NEW CMU WALL SECTIONS INTERIOR AND EXTERIOR TO MATCH REST OF BUILDING.

CODE NOTES:

- OCCUPANCY TYPE: U
- CONSTRUCTION TYPE: IIB

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

REVISION	DATE	BY	APPROVED

DEPARTMENT OF WATER
COUNTY OF KAUAI

JOB NO. WRK-03

MCC, CHLORINATION FACILITIES -
KĪLAUEA WELLS NO. 1 AND NO. 2
KĪLAUEA, KAUA'I, HAWAII

EXISTING PUMP CONTROL BUILDING
DEMOLITION & RENOVATION PLANS

DESIGNED BY: PFM DRAWN BY: PDC/PFM CHECKED BY: PFM

APPROVED BY: *Paul F. Morgan* 3/11/19 DATE

MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI

Paul F. Morgan LICENSED PROFESSIONAL ARCHITECT No. 5575 HAWAII, USA

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4/30/20 EXP DATE

SHEET 17 OF 60 SHEETS A-201

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GENERAL

- G 1 SCOPE
THE GENERAL NOTES AND STANDARD DETAILS ARE GENERAL AND APPLY TO THE ENTIRE PROJECT EXCEPT WHERE THERE ARE SPECIFIC INDICATIONS TO THE CONTRARY.
G 2 PRECEDENCE
IF THERE IS A CONFLICT BETWEEN PROJECT SPECIFICATIONS AND STRUCTURAL DRAWINGS, INCLUDING STRUCTURAL NOTES, CONTACT THE STRUCTURAL ENGINEER OF RECORD FOR CLARIFICATION.
G 3 DIMENSIONS
STRUCTURAL DIMENSIONS CONTROLLED BY OR RELATED TO THE MECHANICAL OR ELECTRICAL EQUIPMENT SHALL BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION.
G 4 PROVISIONS FOR EQUIPMENT
MECHANICAL AND ELECTRICAL EQUIPMENT SUPPORTS, ANCHORAGES, OPENINGS, RECESSES AND EMBEDMENTS NOT SPECIFIED ON THE STRUCTURAL DRAWINGS, BUT SPECIFIED ON OTHER CONTRACT DRAWINGS, SHALL BE PROVIDED PRIOR TO CASTING CONCRETE.
G 5 MEANS, METHODS & CONSTRUCTION LOADS
CONTRACT DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE.
G 6 SAFETY
CONTRACTOR SHALL TAKE ADEQUATE PRECAUTIONS TO ENSURE THE SAFETY OF WORKERS AND VISITORS TO THE SITE.
G 7 OPENINGS
OPENINGS THROUGH NEW AND EXISTING WALLS AND SLABS FOR PIPES, DUCTS, CONDUITS, ETC., ARE NOT ALL SHOWN ON THE STRUCTURAL DRAWINGS.

DESIGN CRITERIA

- D 1 GOVERNING BUILDING CODE
CONSTRUCTION SHALL BE IN ACCORDANCE WITH 2006 INTERNATIONAL BUILDING CODE WITH HAWAII "STATE BUILDING CODE" AMENDMENTS.
D 2 LIVE LOADS
1. GENERATOR BUILDING SLAB ON GRADE 300 PSF
2. ROOF LIVE LOAD 20 PSF
D 3 MAJOR EQUIPMENT LOADS
1. GENERATOR DL = 7,500 LBS
2. TRAILER (12,000 LB RATING) WITH FUEL DL = 4,050 LBS
D 4 WIND
BASIC WIND SPEED (INCREASED FROM CODE MINIMUM AT REQUEST OF DOW) 125 MPH
D 6 SEISMIC
MCE ACCELERATION, SHORT PERIOD Ss = .221 g
MCE ACCELERATION, 1-SEC PERIOD S1 = .062 g
DESIGN ACCEL, SHORT PERIOD SDS = 0.236 g
DESIGN ACCEL, 1-SEC PERIOD SD1 = 0.099 g
SEISMIC IMPORTANCE CATEGORY IV
SEISMIC IMPORTANCE FACTOR (SOLE WATER SUPPLY FOR ISLAND) I = 1.50
SEISMIC DESIGN CATEGORY C
BEARING ORDINARY REINFORCED MASONRY SHEAR WALLS (ASCE 7-05, TABLE 12.2-1) R = 2

FOUNDATION

- F 1 DESIGN BASIS
FOUNDATION DESIGN IS BASED ON RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL INVESTIGATION KILAUEA WELLS GENERATOR SHELTER, DEPARTMENT OF WATER, KILAUEA, KAUAI, HAWAII, BY HIRATA AND ASSOCIATES, DATED JULY 3, 2017.

FOUNDATION (CONTINUED)

- F 2 ALLOWABLE BEARING PRESSURE
SHALLOW FOUNDATIONS BEARING DIRECTLY ON THE UNDISTURBED CLAYEY SILT SHALL BEAR ON AT LEAST 6-INCHES OF AGGREGATE BASE COURSE AND HAVE BEEN DESIGNED FOR AN ALLOWABLE BEARING PRESSURE OF 2,500 PSF.
F 3 MINIMUM FOUNDATION PREPARATION
CONVENTIONAL SHALLOW FOUNDATIONS BEARING DIRECTLY ON THE UNDISTURBED CLAYEY SILT MAY BE USED TO SUPPORT THE PROPOSED GENERATOR SHELTER.
F 4 DIFFERING CONDITIONS
FOUNDATION CONDITIONS NOTED DURING CONSTRUCTION WHICH DIFFER FROM THOSE INDICATED IN THE REPORT SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE CONSTRUCTION MANAGER.
F 5 EXCAVATION, DE-WATERING & SAFETY
CONTRACTOR SHALL PROVIDE FOR ALL DE-WATERING OF EXCAVATIONS, AND DESIGN / PROVIDE ALL CRIBBING, SHORING AND BRACING REQUIRED FOR SAFETY AND TO ALLOW CONSTRUCTION OF THE WORK PRESENTED HEREIN.
F 6 STRUCTURAL BACKFILL
UNLESS NOTED OTHERWISE, STRUCTURAL BACKFILL SHALL BE PLACED IN UNIFORM LAYERS AND SHALL BE BROUGHT UP UNIFORMLY AROUND THE STRUCTURE.

CONCRETE

- C 1 APPLICABLE CODES
CONCRETE CONSTRUCTION SHALL CONFORM TO ACI 301-05 "SPECIFICATIONS FOR STRUCTURAL CONCRETE", AND THE FOLLOWING CODES:
ACI 318-05 "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE"
C 2 REINFORCING STEEL DETAILS
ALL DETAILING, FABRICATION AND ERECTION OF REINFORCING BARS, UNLESS OTHERWISE NOTED, SHALL BE IN ACCORDANCE WITH ACI DETAILING MANUAL (ACI SP-66), LATEST EDITION.
C 3 DESIGN STRENGTH
1. STRUCTURAL CAST-IN-PLACE CONCRETE fc = 4,500 PSI
2. REINFORCED STEEL ASTM A615, GRADE 60 DEFORMED BARS UNLESS OTHERWISE NOTED
C 4 CONCRETE COVER
CONCRETE COVER FOR REINFORCING BARS SHALL CONFORM TO ACI 350 AND AS FOLLOWS WITH MINIMUM COVER OF ONE BAR DIAMETER:
1. CONCRETE CAST AGAINST EARTH 3"
2. CONCRETE EXPOSED TO EARTH, WASTEWATER, CHEMICALS OR WEATHER 2"
3. CONCRETE NOT EXPOSED TO EARTH, WASTEWATER, CHEMICALS OR WEATHER 1-1/2"
C 5 BAR DEVELOPMENT AND LAP SPLICE LENGTH
SEE TABLE AT THE END OF THESE STRUCTURAL NOTES.
C 6 STANDARD HOOKS
BARS ENDING IN RIGHT ANGLE BENDS OR HOOKS SHALL CONFORM TO THE REQUIREMENTS OF PARAGRAPH 7.1 ACI-318.
C 7 CHAMFERS
EXCEPT AS OTHERWISE REQUIRED, EXPOSED CONCRETE CORNERS AND EDGES SHALL HAVE 3/4" CHAMFERS.
C 8 ANCHOR BOLTS
ANCHOR BOLTS SHALL BE STAINLESS STEEL TYPE 316 MATERIAL UNLESS OTHERWISE NOTED (SEE SPECIFICATIONS).
C 9 COMPATIBLE FINISHES
CURING COMPOUNDS AND OTHER SURFACE TREATMENTS, CONCRETE ADMIXTURES AND SUB-SLAB DRAINAGE SHALL BE REVIEWED BY CONTRACTOR AND CERTIFIED COMPATIBLE WITH FINISHES TO BE APPLIED LATER IN THE CONSTRUCTION SEQUENCE.
C 10 VAPOR BARRIER BELOW SLAB ON GRADE
VAPOR BARRIER, WHERE NOTED ON THE DRAWINGS, SHALL BE 10 MIL MINIMUM CLASS A OR B PLASTIC WATER VAPOR RETARDER PER ASTM E1745.

STEEL

- S 1 BOLLARDS
PROVIDE 6 INCH GALVANIZED STANDARD WEIGHT STEEL PIPE PAINTED SAFETY YELLOW. PIPE TO BE IN ACCORDANCE WITH ASTM A53. ANCHOR POSTS IN CONCRETE AS INDICATED AND FILL SOLIDLY WITH CONCRETE WITH MINIMUM COMPRESSIVE STRENGTH OF 2,500 PSI.

GROUT

- GR 1 EQUIPMENT GROUTING
SEE MECHANICAL SPECIFICATIONS AND SPECIFICATION SECTION SP-5.6, GROUT.
GR 2 EPOXY ADHESIVE GROUT AT ANCHORS INTO CONCRETE: HILTI HIT-RE 500v3 EPOXY ADHESIVE ANCHOR SYSTEM BY HILTI INC. OR EQUAL APPROVED BY ENGINEER OF RECORD.
GR 3 EPOXY ADHESIVE GROUT AT ANCHORS INTO CMU WALLS: HIT-HY 70 BY HILTI INC. OR EQUAL APPROVED BY ENGINEER OF RECORD.

REINFORCED CONCRETE MASONRY

- MA 1 CONCRETE MASONRY UNITS (CMU) SHALL BE HOLLOW LOAD BEARING UNITS CONFORMING TO ASTM C90, 115 PCF MEDIUM WEIGHT, PRISM STRENGTH (fm) = 2000 PSI.
MA 2 CMU WALLS SHALL BE SOLID GROUTED.
MA 3 MORTAR SHALL BE TYPE S CONFORMING TO ASTM C270.
MA 4 CMU AND MORTAR SHALL CONTAIN "DRY BLOCK ADMIXTURE" AS MANUFACTURED BY W.R. GRACE CO., AMOUNT PER MANUFACTURER'S RECOMMENDATION.
MA 5 GROUT SHALL BE fc = 2000 PSI CONFORMING TO ASTM C476.
MA 6 REINFORCING STEEL SHALL BE ASTM A615, GRADE 60 DEFORMED BARS.
MA 7 RUNNING BOND SHALL BE USED THROUGHOUT.
MA 8 USE 3/8" FLUSH MORTAR JOINTS THROUGHOUT, TOOLED CONCAVE.

SPECIAL INSPECTIONS

- SI 1 AN INDEPENDENT TESTING COMPANY RETAINED BY THE DOW AND APPROVED BY THE BUILDING OFFICIAL SHALL INSPECT THE FOLLOWING (SEE EXPANDED LIST ON DRAWINGS S-002, SPECIFICATIONS AND GOVERNING CODE):
1. SOIL COMPACTION AT FOUNDATIONS.
2. REINFORCING BAR, CONCRETE PLACEMENT AND TAKING OF CONCRETE TEST SPECIMENS.
3. ANCHOR BOLTS.
4. EXPANSION ANCHOR INSTALLATION.
5. ANCHORS INSTALLED USING EPOXY ADHESIVE.
6. HIGH STRENGTH BOLTING.
7. MASONRY CONSTRUCTION.
8. MECHANICAL AND ELECTRICAL EQUIPMENT, PERIODIC SPECIAL INSPECTION OF STRUCTURAL COMPONENTS FOR SEISMIC RESISTANCE:
A. ANCHORAGE OF ELECTRICAL EQUIPMENT.
B. EMERGENCY AND STANDBY POWER SYSTEMS.
C. PIPING SYSTEMS INTENDED TO CARRY FLAMMABLE, COMBUSTIBLE OR HIGHLY TOXIC CONTENTS AND THEIR ASSOCIATED UNITS.
D. HVAC DUCTWORK THAT WILL CONTAIN HAZARDOUS MATERIALS.
E. INSTALLATION OF COMPONENTS WHERE THE COMPONENT IMPORTANCE FACTOR IS 1.5.
F. ELECTRICAL MOTORS, TRANSFORMERS, SWITCHGEAR UNIT SUBSTATIONS AND MOTOR CONTROL CENTERS.
G. TANKS, HEAT EXCHANGERS AND PRESSURE VESSELS.
H. EQUIPMENT USING COMBUSTIBLE ENERGY SOURCES.
J. EQUIPMENT VIBRATION ISOLATION SYSTEMS.
SI 2 CONTRACTOR SHALL NOTIFY THE TESTING COMPANY FOR ALL INSPECTIONS.

STRUCTURAL OBSERVATIONS

- SO 1 THE DOW SHALL RETAIN A REGISTERED DESIGN PROFESSIONAL TO PERFORM STRUCTURAL OBSERVATIONS.
SO 2 REQUIRED STRUCTURAL OBSERVATIONS INCLUDE:
1. STRUCTURAL FILL.
2. FOUNDATIONS PREPARED FOR CONCRETE PLACEMENT.
3. COMPLETION OF BEARING WALLS PRIOR TO COVER-UP WITH NON-STRUCTURAL ELEMENTS.
4. PRIOR TO GROUTING FIRST LIFT OF CONCRETE MASONRY CONSTRUCTION.
5. COMPLETION OF LATERAL FORCE RESISTING ELEMENTS INCLUDING MOMENT CONNECTIONS, BRACING, DIAPHRAGMS, AND OTHER ELEMENTS.

STRUCTURAL DEFERRED SUBMITTALS (IBC 2006, SECTION 106.3.4.2)

- SDS 1 THE CONTRACTOR SHALL SUBMIT DRAWINGS AND CALCULATIONS BEARING THE SEAL OF A PROFESSIONAL ENGINEER LICENSED IN THE STRUCTURAL DISCIPLINE IN HAWAII TO THE ENGINEER FOR REVIEW.
STRUCTURAL DEFERRED SUBMITTALS INCLUDE:
1. ANCHOR BOLTS FOR ALL EQUIPMENT ANCHORAGE.
2. CONSTRUCTION SHORING.

TENSION DEVELOPMENT AND LAP SPLICE LENGTHS (IN INCHES) FOR UNCOATED BARS IN NORMAL-WEIGHT CONCRETE WITH fc' = 4,000 PSI OR HIGHER

THIS TABLE IS GOOD ONLY FOR CENTER/CENTER SPACING OF REINFORCING BARS EQUAL TO THE MINIMUM SHOWN OR GREATER. NO TRANSVERSE REINFORCING ASSUMED.

Table with columns: BAR SIZE, APPLICATION, CONCRETE COVER = 1.50 IN., CONCRETE COVER = 2.00 IN., CONCRETE COVER = 3.00 IN. (with sub-columns for TOP, OTHER, MIN C/C SPACING).

- NOTES:
1. TABULATED VALUES ARE BASED ON GRADE 60 REINFORCING BARS AND NORMAL-WEIGHT CONCRETE.
2. TENSION DEVELOPMENT LENGTHS AND TENSION LAP SPLICE LENGTHS ARE CALCULATED PER ACI 318-05, SECTIONS 12.2.3 AND 12.15, RESPECTIVELY.
3. LAP SPLICE LENGTHS ARE LAP CLASS B = 1.3 ld (ACI 318-05, SECTION 12.15.1).
4. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12 IN. OF FRESH CONCRETE CAST BELOW THE BARS.

Professional Engineer Seal for David E. McCleary, Department of Water, County of Kauai, Structural General Notes, Design and Approval signatures, Date 3/11/19, SHEET 18 OF 60 SHEETS S-001.

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TABLE 1 REQUIRED SPECIAL INSPECTIONS - STRUCTURAL SYSTEMS				
SYSTEM OR MATERIAL	REQUIRED INSPECTION	FREQUENCY OF INSPECTION		REMARKS
		CONTINUOUS	PERIODIC	
SOILS	VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL		X	
	VERIFY SOIL MATERIALS BELOW FOOTINGS ARE ADEQUATE TO ACHIEVE DESIGN BEARING CAPACITY		X	
	PRIOR TO PLACEMENT OF CONTROLLED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY		X	
	PERFORM CLASSIFICATION AND TESTING OF CONTROLLED FILL MATERIALS		X	SEE TABLE 3
CONCRETE	VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF CONTROLLED FILL	X		SEE TABLE 3
	PROOF ROLLING OF SOILS DISTURBED BY GROUND IMPROVEMENTS		X	
	INSPECT FORMWORK FOR LOCATION AND DIMENSIONS OF MEMBER BEING FORMED		X	
	VERIFY MATERIAL FOR REINFORCEMENT		X	CONTRACTOR TO SUBMIT CERTIFIED MILL TEST REPORTS
	REINFORCING STEEL PLACEMENT		X	
	INSPECT ANCHORS TO BE CAST IN CONCRETE		X	PRIOR TO AND DURING CONCRETE PLACEMENT
	INSPECT POST-INSTALLED CONCRETE ANCHORS: - HORIZONTAL AND UPWARDLY INCLINED ADHESIVE ANCHORS - OTHER ANCHORS UNLESS ICC REPORT REQUIRED CONTINUOUS INSPECTION	X		INSPECTION TO CONFORM TO IBC AND TO ANCHOR MANUFACTURER'S RECOMMENDATIONS AND ICC REPORTS
	VERIFY USE OF REQUIRED CONCRETE MIX DESIGN(S)		X	
	AT THE TIME FRESH CONCRETE IS SAMPLED TO FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND TEMPERATURE OF CONCRETE	X		CONTINUOUS DURING PREPARATION OF SAMPLES
	CONCRETE PLACEMENT	X		
MASONRY	INSPECTION FOR MAINTENANCE OF CURING PROCEDURES AND TEMPERATURE		X	VERIFY APPROPRIATE CURING METHOD HAS BEEN IMPLEMENTED AFTER EACH POUR
	VERIFY IN-SITU CONCRETE STRENGTH PRIOR TO REMOVAL OF SHORES AND FORMS FROM STRUCTURAL SLABS AND BEAMS		X	
	CEMENTITIOUS GROUTING OF BASE PLATES AND EPOXY GROUTING FOR EQUIPMENT MOUNTING	X		
	VERIFY PROPORTIONS OF SITE -PREPARED MORTAR AND GROUT		X	AT START OF MASONRY CONSTRUCTION
	VERIFY SPECIFIED TYPE, GRADE AND SIZE OF REINFORCEMENT		X	CONTRACTOR TO SUBMIT CERTIFIED MILL TEST REPORTS
	VERIFY MATERIALS FOR MASONRY UNITS, MORTAR, GROUT, ANCHORS, TIES AND ACCESSORIES		X	CONTRACTOR TO SUBMIT MANUFACTURER'S CERTIFIED COMPLIANCE REPORTS
	VERIFY TYPE, SIZE, LOCATION AND INSTALLATION OF EMBEDDED CONNECTORS AND ANCHORS		X	
	VERIFY SIZE AND LOCATION OF STRUCTURAL ELEMENTS		X	
	VERIFY TYPE, SIZE AND LOCATION OF ANCHORAGE OF MASONRY TO OTHER CONSTRUCTION		X	
	VERIFY PROTECTION PROVISIONS FOR COLD AND HOT WEATHER MASONRY CONSTRUCTION		X	
PLACEMENT OF MASONRY UNITS AND CONSTRUCTION OF MORTAR JOINTS		X		
REINFORCING STEEL PLACEMENT		X		
VERIFY GROUT SPACE IS CLEAN		X		
VERIFY PROPORTIONS OF GROUT; USE OF REQUIRED GROUT MIX DESIGN		X		
OBSERVE GROUT PLACEMENT	X			
OBSERVE PREPARATION OF ANY GROUT OR MORTAR SPECIMENS AND/OR PRISMS	X		CONTINUOUS DURING PREPARATION OF SAMPLES	

TABLE 2 REQUIRED SPECIAL INSPECTIONS - NONSTRUCTURAL SYSTEMS				
SYSTEM OR MATERIAL	REQUIRED INSPECTION	FREQUENCY OF INSPECTION		REMARKS
		CONTINUOUS	PERIODIC	
MECHANICAL	INSPECT ANCHORAGE OF FIRE SPRINKLER SYSTEM		X	
	INSPECT ANCHORAGE OF ALL MECHANICAL SYSTEMS (INCLUDING EQUIPMENT PIPING, DUCT WORK, ETC.) REQUIRING STANDBY POWER		X	
	CERTIFICATE OF COMPLIANCE FOR ALL MECHANICAL EQUIPMENT REQUIRING STANDBY POWER			EQUIPMENT MANUFACTURER SHALL PROVIDE CERTIFICATE OF COMPLIANCE
ELECTRICAL	INSPECT ANCHORAGE OF ELECTRICAL EQUIPMENT FOR STANDBY POWER		X	
	INSPECT ANCHORAGE OF ALL OTHER ELECTRICAL EQUIPMENT REQUIRING STANDBY POWER		X	
	CERTIFICATE OF COMPLIANCE FOR ALL ELECTRICAL EQUIPMENT FOR STANDBY POWER AND ALL ELECTRICAL EQUIPMENT REQUIRING STANDBY POWER			EQUIPMENT MANUFACTURER SHALL PROVIDE CERTIFICATE OF COMPLIANCE
	EMERGENCY LIGHTING		X	

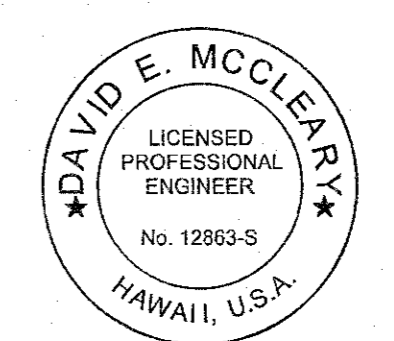
TABLE 3 REQUIRED TESTING FOR SPECIAL INSPECTIONS			
SYSTEM OR MATERIAL	TESTING		REMARKS
	CODE OR STANDARD REFERENCE	FREQUENCY	
GEOTECHNICAL			
PREPARED SUBGRADE DENSITY	ASTM D6938	EACH 300 SF OF PREPARED SUBGRADE	PER GEOTECHNICAL REPORT
FILL IN-PLACE DENSITY	ASTM D6938	EACH 300 SF OF EACH LIFT PLACED EACH DAY	PER GEOTECHNICAL REPORT
CONCRETE			
CONCRETE COMPRESSIVE STRENGTH	ASTM C31,ASTM C39,ASTM C172	SEE SPECIFICATION SP-5.2	
CONCRETE SLUMP	ASTM C143	WHENEVER CYLINDERS ARE CAST	
CONCRETE AIR CONTENT	ASTM C231	WHENEVER CYLINDERS ARE CAST	
CONCRETE TEMPERATURE	ASTM C1064	WHENEVER CYLINDERS ARE CAST	
CEMETITIOUS AND EPOXY GROUT COMPRESSIVE STRENGTH	ASTM C942 (CEMENTITIOUS) ASTM C579 (EPOXY)		TEST 2' CUBES FOR EACH GROUT SHIPMENT TO THE FIELD
MASONRY			
COMPRESSIVE STRENGTH, f _m , OF MASONRY ASSEMBLIES			PRIOR TO START OF MASONRY CONSTRUCTION, CONTRACTOR SHALL SUBMIT VERIFICATION OF COMPRESSIVE STRENGTH FOR EACH TYPE OF MASONRY ASSEMBLY. PRISM TEST METHOD SHALL BE USED.
MASONRY UNIT STRENGTH	ASTM C140	(12) UNITS PER EACH 50000 UNITS	CONTRACTOR TO SUBMIT MANUFACTURER'S CERTIFIED TEST REPORTS FOR EACH TYPE OF MASONRY UNIT
GROUT STRENGTH	ASTM C1019	EACH 5000 SF OF WALL	COMPRESSIVE STRENGTH, AIR CONTENT, SLUMP, TEMPERATURE OF FILL FOR MASONRY ASSEMBLIES SHALL BE TESTED PER CONCRETE REQUIREMENTS ABOVE.

QUALITY ASSURANCE NOTES

- THE QUALITY OF THE WORKMANSHIP AND THE QUALITY OF THE MATERIALS OF CONSTRUCTION ARE GOVERNED BY THE INTERNATIONAL BUILDING CODE, 2006 EDITION (IBC).
- ALL NEW STRUCTURES AND MODIFICATIONS TO EXISTING STRUCTURES TO BE CONSTRUCTED AS A PART OF THIS PROJECT ARE CLASSIFIED AS OCCUPANT CATEGORY IV (SOLE WATER SUPPLY FOR ISLAND), IN ACCORDANCE WITH THE IBC. THE STRUCTURES ARE CLASSIFIED AS SEISMIC DESIGN CATEGORY C.
- TO ASSURE THE QUALITY OF THE CONSTRUCTION OF THIS PROJECT, STRUCTURAL TESTS, SPECIAL INSPECTION AND STRUCTURAL OBSERVATION WILL BE PERFORMED IN ACCORDANCE WITH IBC, CHAPTER 17.
- WHERE FREQUENCY OF INSPECTION IS SPECIFIED TO BE CONTINUOUS, THE SPECIAL INSPECTOR IS EXPECTED TO BE PRESENT IN THE AREA WHERE THE WORK IS BEING PERFORMED AND PROVIDING FULL-TIME OBSERVATION OF THE WORK REQUIRING SPECIAL INSPECTION.
- WHERE FREQUENCY OF INSPECTION IS SPECIFIED TO BE PERIODIC, THE SPECIAL INSPECTOR IS EXPECTED TO BE PRESENT IN THE AREA WHERE THE WORK HAS BEEN OR IS BEING PERFORMED AND AT THE COMPLETION OF THE WORK (PRIOR TO THE NEXT CONSTRUCTION TASK).
- SPECIAL INSPECTIONS ARE IN ADDITION TO INSPECTIONS BY THE BUILDING OFFICIALS. CONSTRUCTION IS SUBJECT TO INSPECTION BY THE BUILDING OFFICIAL. COORDINATE WITH BUILDING DEPARTMENT TO DETERMINE REQUIRED INSPECTIONS.
- CONTRACTOR SHALL PROVIDE ACCESS TO THE WORK FOR REQUIRED INSPECTIONS. CONTRACTOR SHALL PROVIDE NOTIFICATION IN ADVANCE OF REQUIRED INSPECTIONS, TESTING AND STRUCTURAL OBSERVATIONS.

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

REVISION	DATE	DREW	BY	APPROVED
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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION.
(OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.)

BY *David E. McCleary* 3/30/20
17/07/2018 EXP DATE

DEPARTMENT OF WATER
COUNTY OF KAUAI

JOB NO. WKK-03

MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2 KĪLAUEA, KAUAI, HAWAII

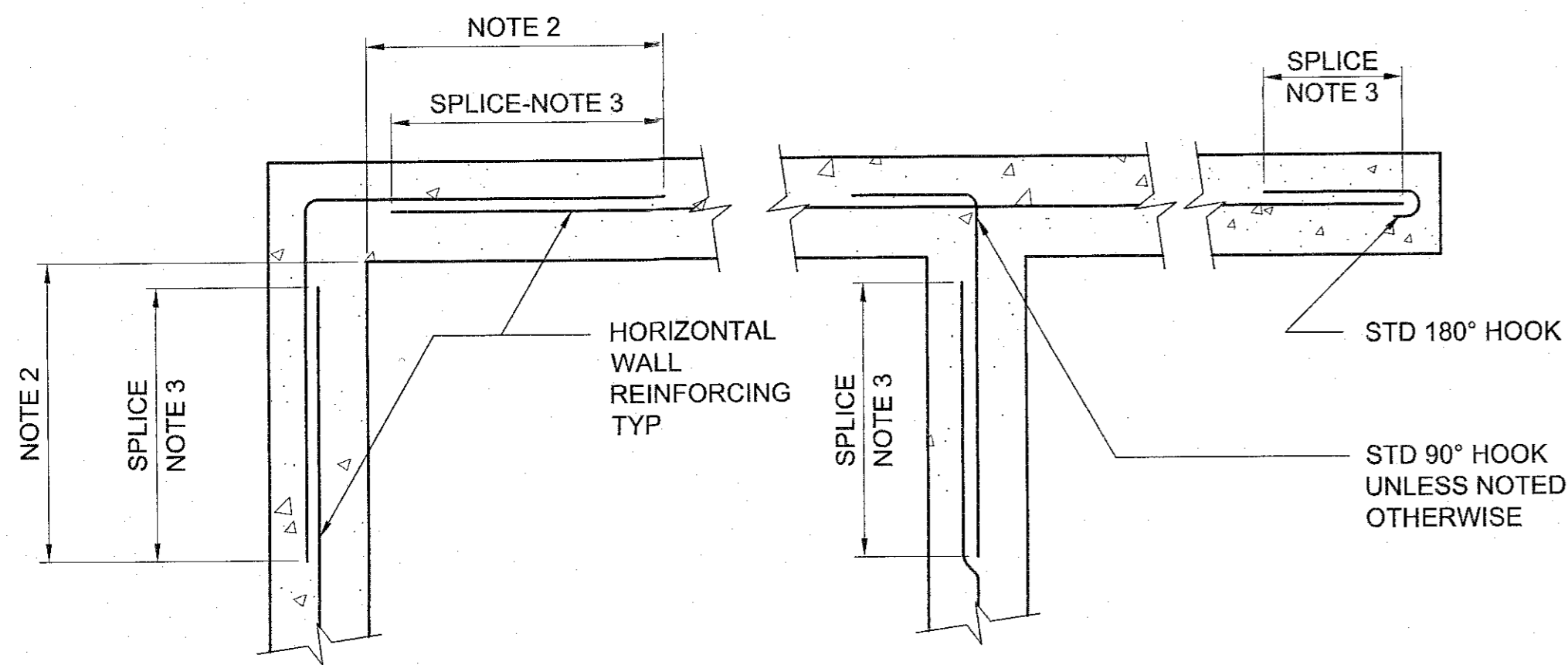
SPECIAL INSPECTION NOTES

DESIGNED BY G.G.M. DRAWN BY R.B.B. CHECKED BY D.E.M.

APPROVED BY: *[Signature]* 3/11/19
MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI DATE

SHEET 19 OF 60 SHEETS S-002

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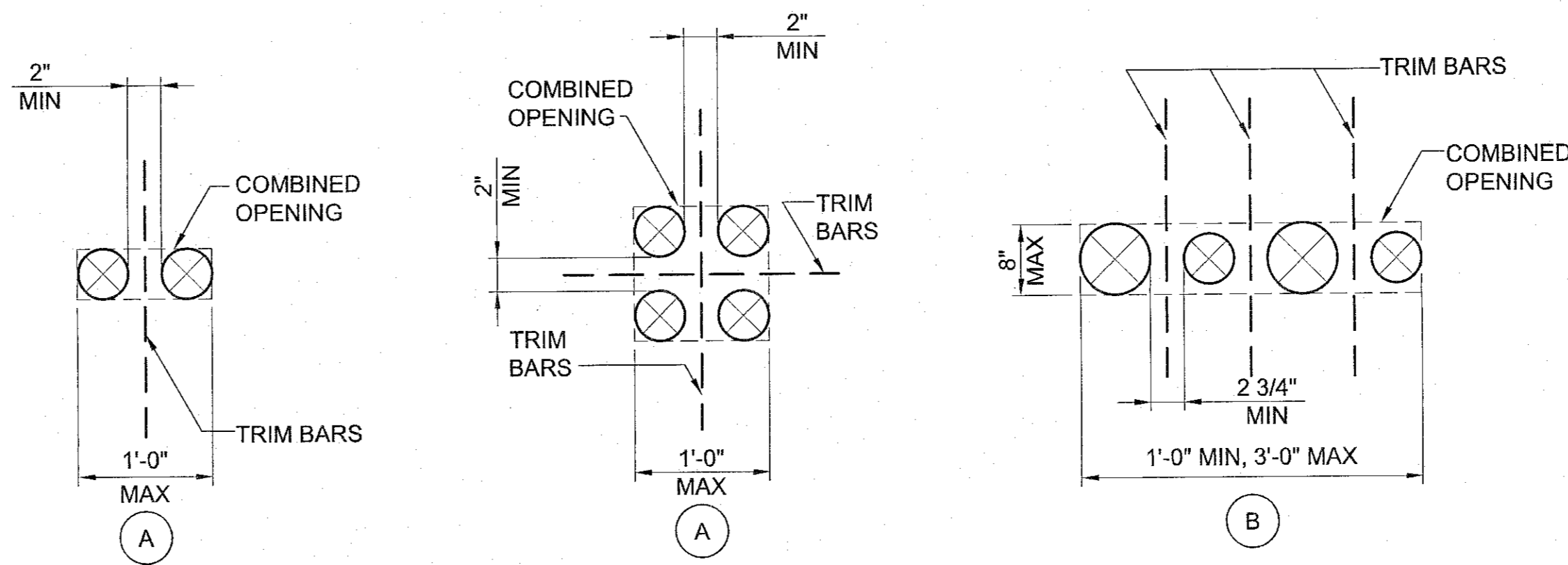


SINGLE MAT REINFORCING

NOTES:

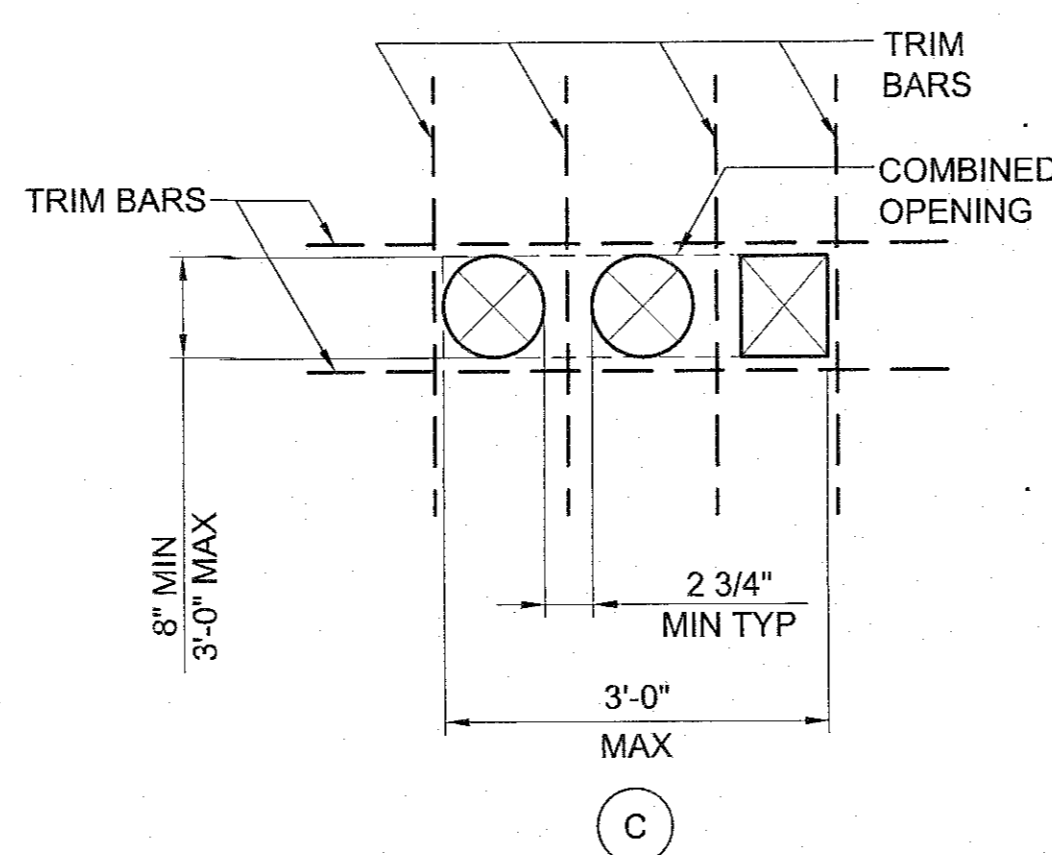
- UNLESS NOTED OTHERWISE, SIZE AND SPACING OF CORNER OR INTERSECTION REINFORCING SHALL MATCH HORIZONTAL REINFORCING SHOWN IN SPECIFIC SECTIONS OR DETAILS. VERTICAL REINFORCING NOT SHOWN FOR CLARITY.
- UNLESS NOTED OTHERWISE, BAR SPLICE SHALL BE LOCATED OUTSIDE OF CORNER OR INTERSECTION AREA TO AVOID CONGESTION. CONTRACTORS OPTION TO PROVIDE SINGLE BENT BAR IN LIEU OF SPLICE CONFIGURATION AT ONE END ONLY.
- SEE GENERAL STRUCTURAL NOTES FOR SPLICE LENGTH. HORIZONTAL WALL BARS SHALL BE CONSIDERED TOP BARS FOR DEVELOPMENT AND SPLICE LENGTHS.

TYPICAL HORIZONTAL WALL REINFORCING

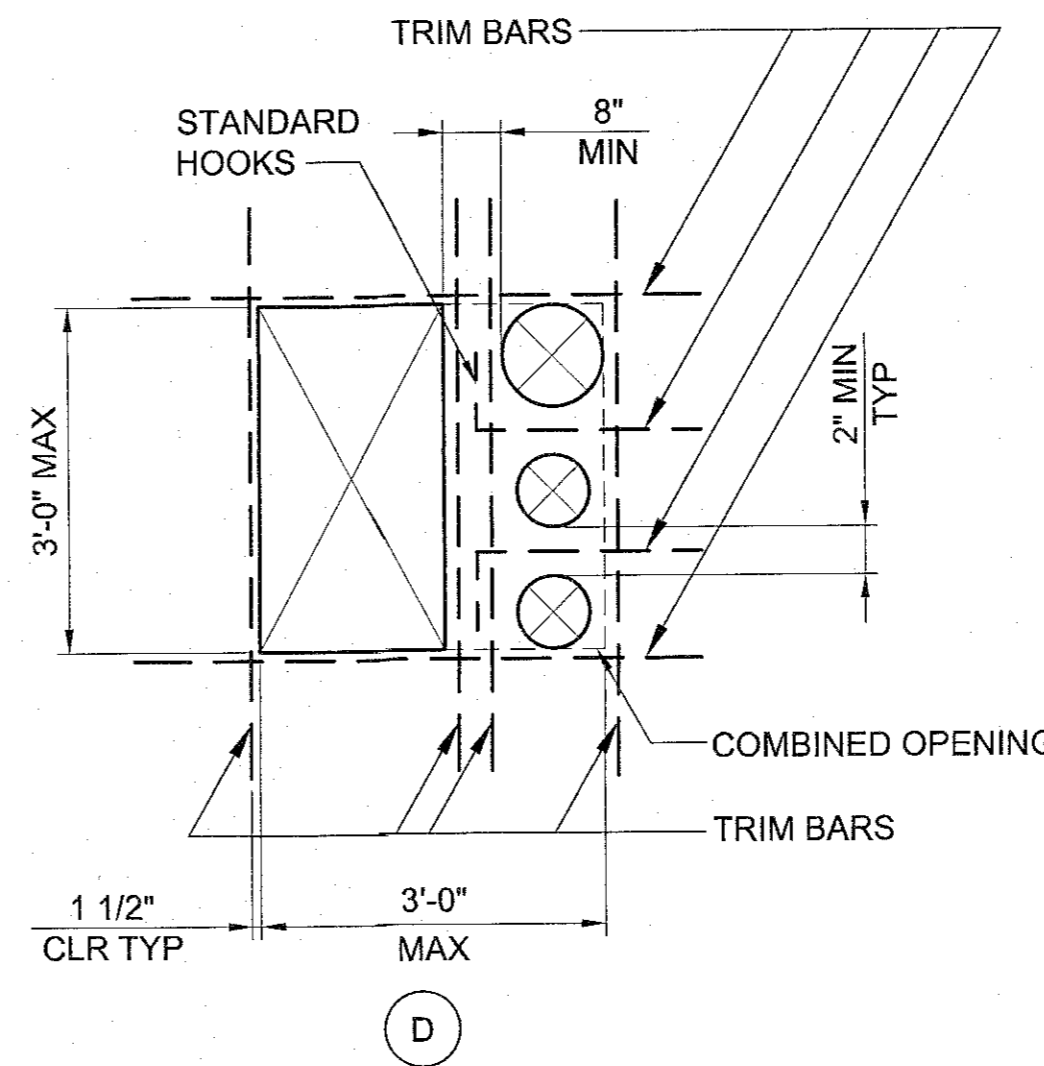


TRIM BAR NOTES:

- OPENINGS IN CONCRETE WHICH ARE CLOSER TO ONE ANOTHER THAN THE DIAMETER OR SHORTER SIDE OF THE LARGER OF THE TWO ARE CONSIDERED TO FORM A COMBINED OPENING.
- THESE DIAGRAMS ARE FOR COMBINED OPENINGS WHOSE LARGER DIMENSION DOES NOT EXCEED 3'-0". SEE DRAWINGS FOR OPENINGS LARGER THAN 3'-0".
- TRIM BAR EXTENSION PAST EDGES OF COMBINED OPENINGS SHALL BE 1'-0" FOR #4 BARS, 1'-6" FOR #5 BARS, AND ONE DEVELOPMENT LENGTH FOR LARGER BARS.
- DISPLACE PRINCIPAL REINFORCEMENT TO EACH SIDE OF COMBINED OPENING OR PLACE BETWEEN INDIVIDUAL OPENINGS. DO NOT CUT PRINCIPAL REINFORCEMENT.
- SEE DETAIL A FOR TRIM BARS FOR INDIVIDUAL OPENINGS.
- SUBMIT SPECIAL SITUATIONS TO DOW FOR REVIEW.

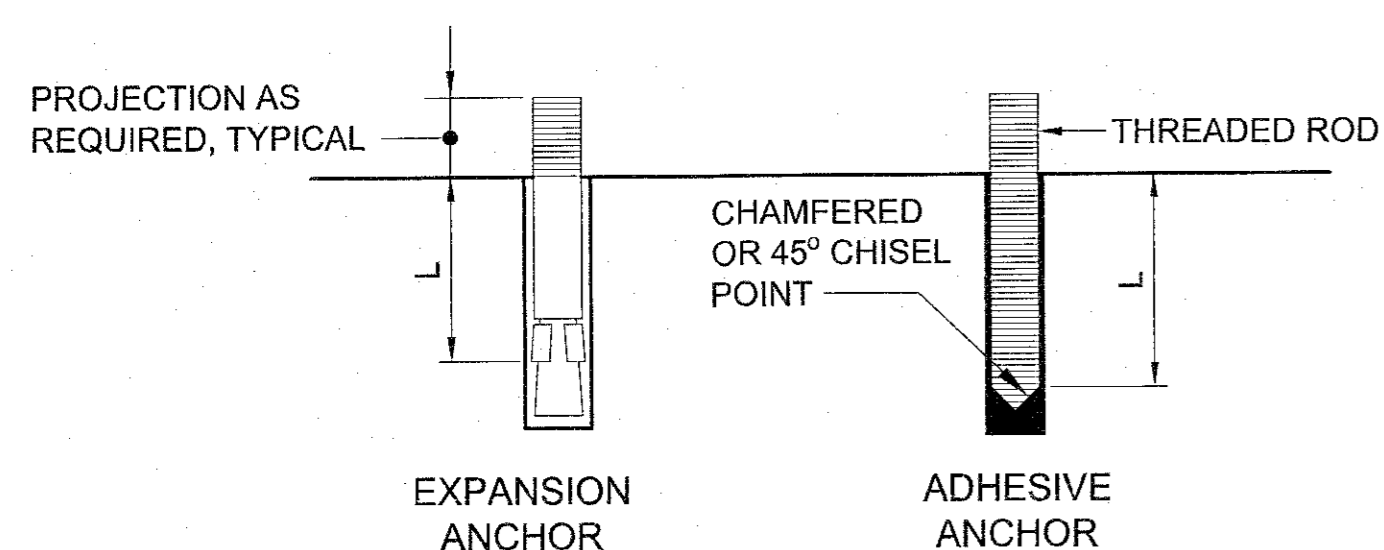


COMBINED OPENING TRIM BARS



TRIM BAR REQUIREMENTS:

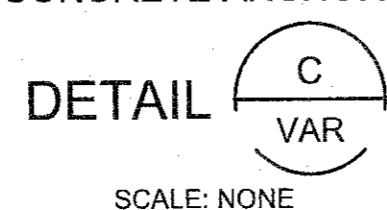
- (A) IF THE COMBINED OPENING IS SMALLER THAN 1'-0", PROVIDE (1) #5 EACH FACE BETWEEN OPENINGS.
- (B) IF THE LARGER DIMENSION OF A COMBINED OPENING EXCEEDS 1'-0" BUT THE SMALLER DIMENSION IS LESS THAN OR EQUAL TO 8", AND PROVIDED THE COMBINED OPENING IS ALIGNED WITH THE PRINCIPAL REINFORCEMENT, PROVIDE (1) #5 EACH FACE BETWEEN OPENINGS.
- (C) IN ALL OTHER CASES WHERE OPENINGS ARE ARRANGED IN A SINGLE LINE, PROVIDE (1) #5 EACH FACE BETWEEN OPENINGS AND (1) #5 EACH FACE AROUND PERIMETER OF COMBINED OPENING.
- (D) WHERE INDIVIDUAL OPENINGS OF A COMBINED OPENING FORM TWO OR MORE ROWS, THE ROWS SHALL BE SEPARATED BY AT LEAST 8" OF CONCRETE. PROVIDE (2) #5 EACH FACE BETWEEN ROWS OF OPENINGS, (1) #5 EACH FACE BETWEEN OPENINGS IN THE PERPENDICULAR DIRECTION, AND (1) #5 EACH FACE AROUND THE PERIMETER OF COMBINED OPENINGS. PROVIDE STANDARD HOOKS WHERE BARS TERMINATE WITHIN THE COMBINED OPENING.



NOTES:

- MINIMUM EMBEDMENT LENGTH PER SCHEDULE UNLESS INDICATED OTHERWISE ON DRAWINGS.
- CONFORM TO ICC EVALUATION SERVICE REPORT REQUIREMENTS AND MANUFACTURER'S RECOMMENDATIONS FOR INSTALLATION.
- THREADED RODS SHALL BE TYPE 316 STAINLESS STEEL MATERIAL UNLESS INDICATED OTHERWISE ON THE DRAWINGS.
- ADHESIVE ANCHOR EMBEDMENT LENGTHS ARE BASED ON HILTI HIT-RE 500v3 ADHESIVE IN 4000 PSI CONCRETE. SUBMIT ICC ES REPORT FOR ALTERNATE PRODUCTS.
- EXPANSION ANCHOR EMBEDMENT LENGTHS ARE BASED ON HILTI KWIK BOLT TZ STAINLESS STEEL ANCHORS IN 4000 PSI NORMAL WEIGHT CONCRETE, SUBMIT ICC EVALUATION SERVICE REPORT (ES REPORT) FOR ALTERNATE PRODUCTS.
- HOLE DIAMETER SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

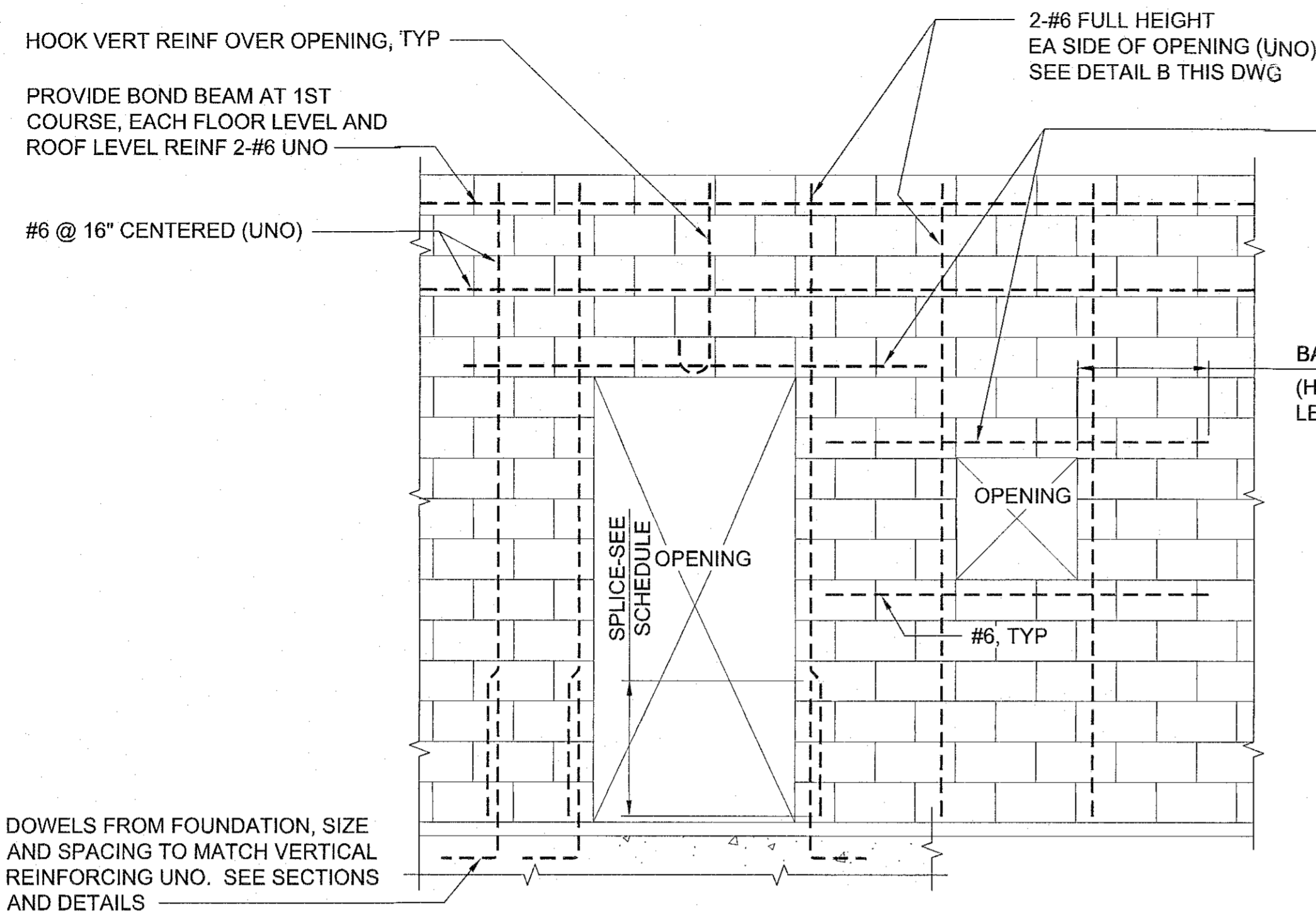
CONCRETE ANCHORS



MINIMUM EMBEDMENT LENGTH, L		
DIAMETER	EXPANSION ANCHOR	ADHESIVE ANCHOR
3/8"	3 1/2"	4 1/2"
1/2"	4 3/4"	6"
5/8"	5 1/2"	7 1/2"
3/4"	6 1/2"	9"
7/8"	-	10 1/2"
1"	-	12"

	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)
	REVISION DATE DREW BY CHECKED BY APPROVED BY
DEPARTMENT OF WATER COUNTY OF KAUAI JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII	
STANDARD DETAILS - 1 DESIGNED BY G.G.M. DRAWN BY R.B.B. CHECKED BY D.E.M.	
APPROVED BY: DATE: 3/11/19 MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI	
SHEET 20 OF 60 SHEETS S-003	

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LINTEL REINFORCING	
OPENING	REINF
6'-0" MAX	1-#6
12'-0" MAX	2-#6

BAR DEVELOPMENT LENGTH
(HOOK WHERE DEVELOPMENT LENGTH CANNOT BE ACHIEVED), TYP

BAR DEVELOPMENT OR SPLICE LENGTH	
BAR SIZE	8" CMU
	SINGLE CURTAIN REINF
6	4'-6"

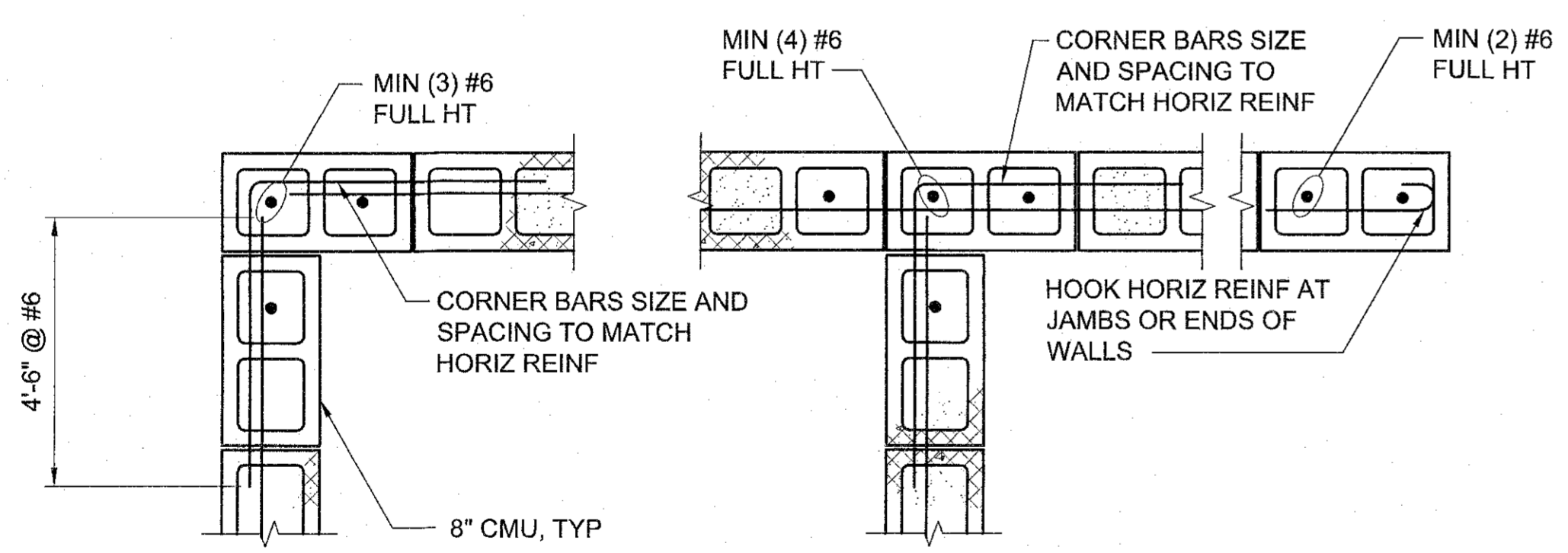
- NOTES:
- GROUT ALL CELLS SOLID.
 - ADDED REINFORCING AROUND OPENINGS, SUCH AS JAMB AND LINTEL REINFORCING, SHALL EXTEND PAST THE OPENING A MINIMUM DISTANCE AS SPECIFIED IN TABLE OF LAP SPLICE LENGTHS, OR BE HOOKED 180° A MIN OF 2'-0" PAST THE OPENING.

- NOTES:
- UNLESS NOTED OTHERWISE IN THE DRAWINGS, ALL DEVELOPMENT AND SPLICE LENGTHS SHALL CONFORM TO THE TABLE ABOVE.
 - MAXIMUM GROUT LIFT HEIGHT = 8'-0".
 - AT GROUT POURS EXCEEDING 5'-4", PROVIDE CLEANOUT INSPECTION PORTS IN BOTTOM COURSE AT ALL VERTICAL REINFORCING BAR LOCATIONS.

TYPICAL MASONRY WALL ELEVATION



SCALE: NONE

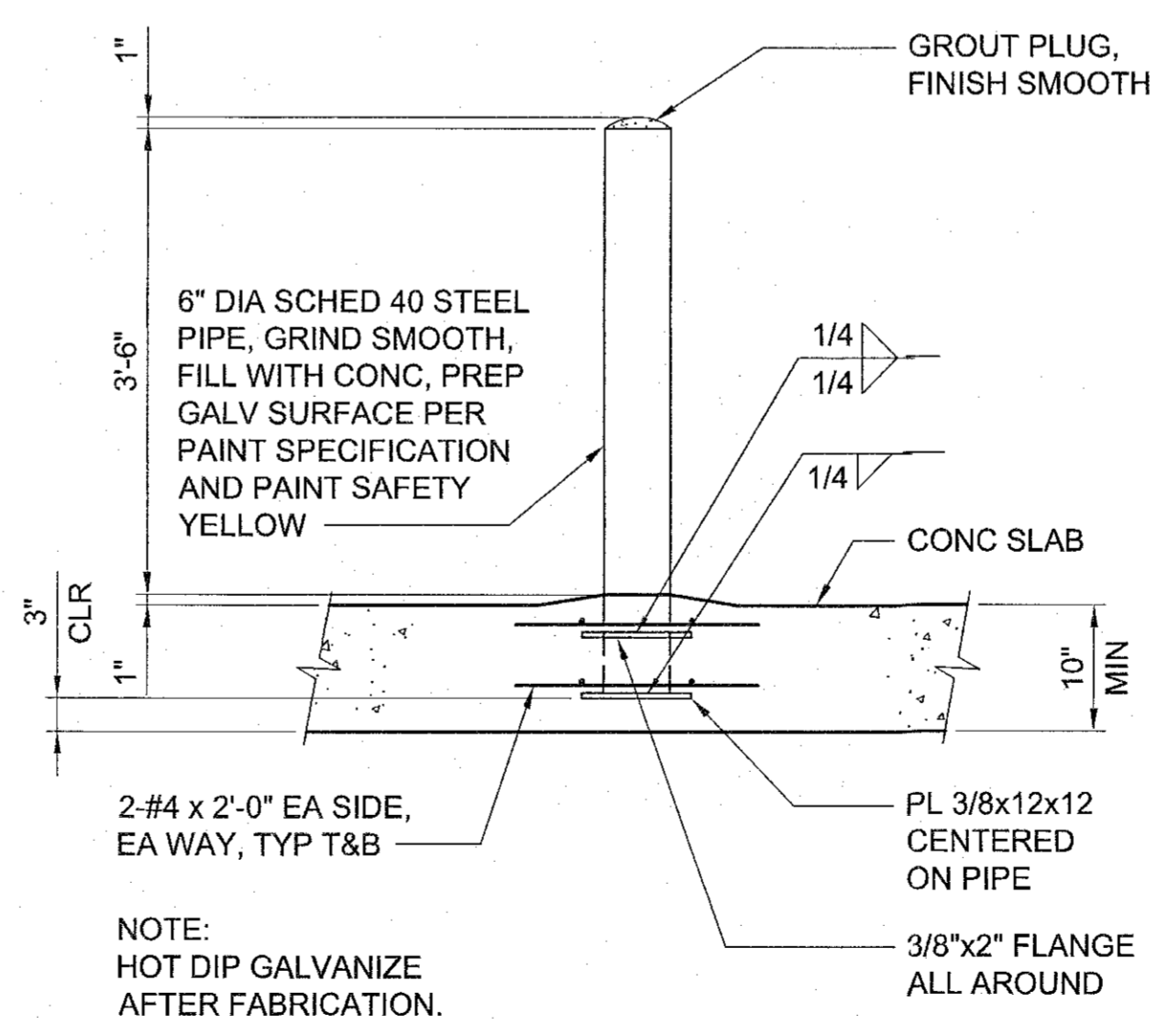


- NOTE:
- ALL CELLS TO BE SOLID GROUTED.

TYPICAL MASONRY CORNER REINFORCING

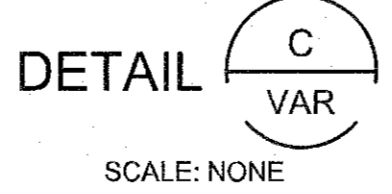


SCALE: NONE



- NOTE:
- HOT DIP GALVANIZE AFTER FABRICATION.

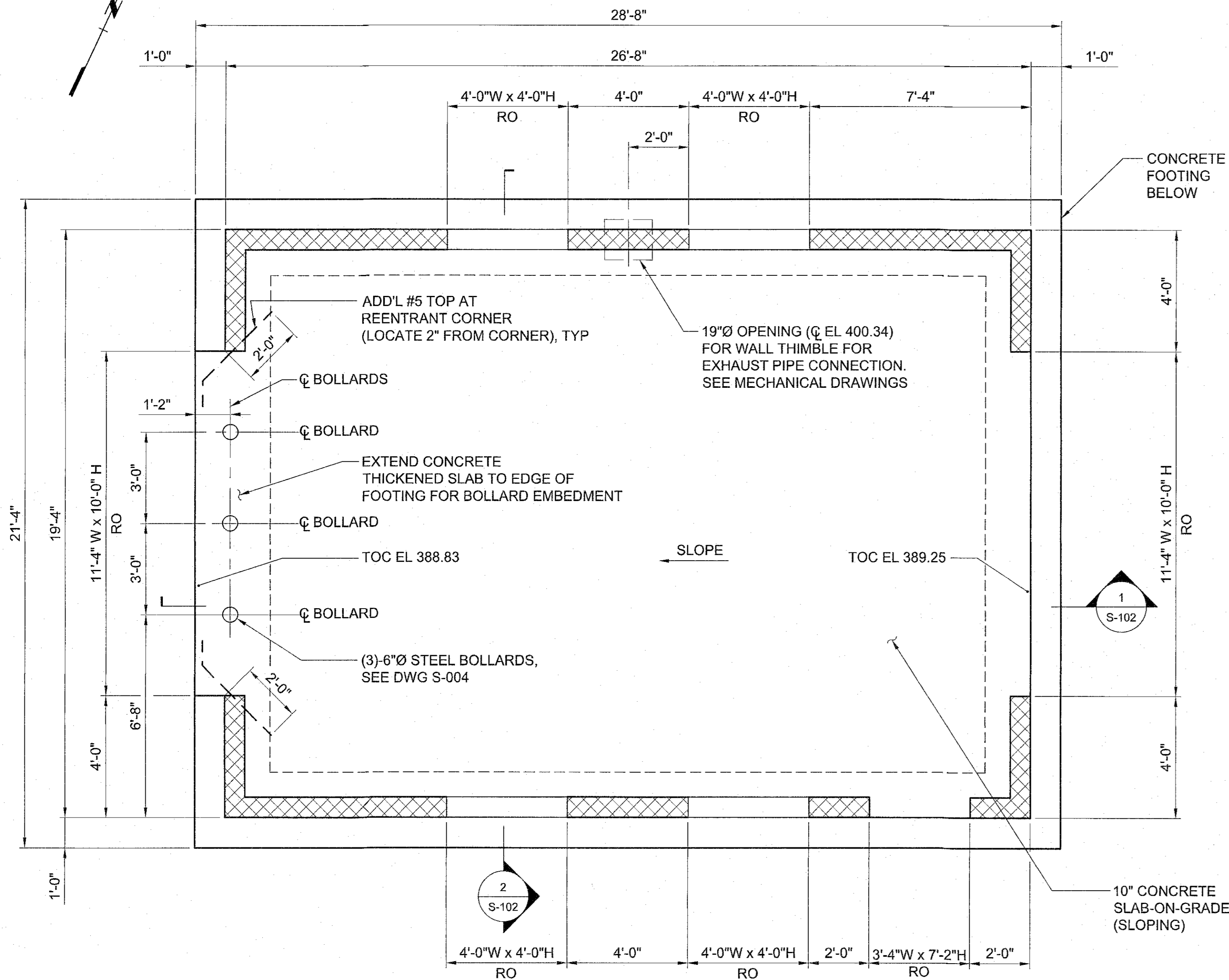
FIXED BOLLARD



SCALE: NONE

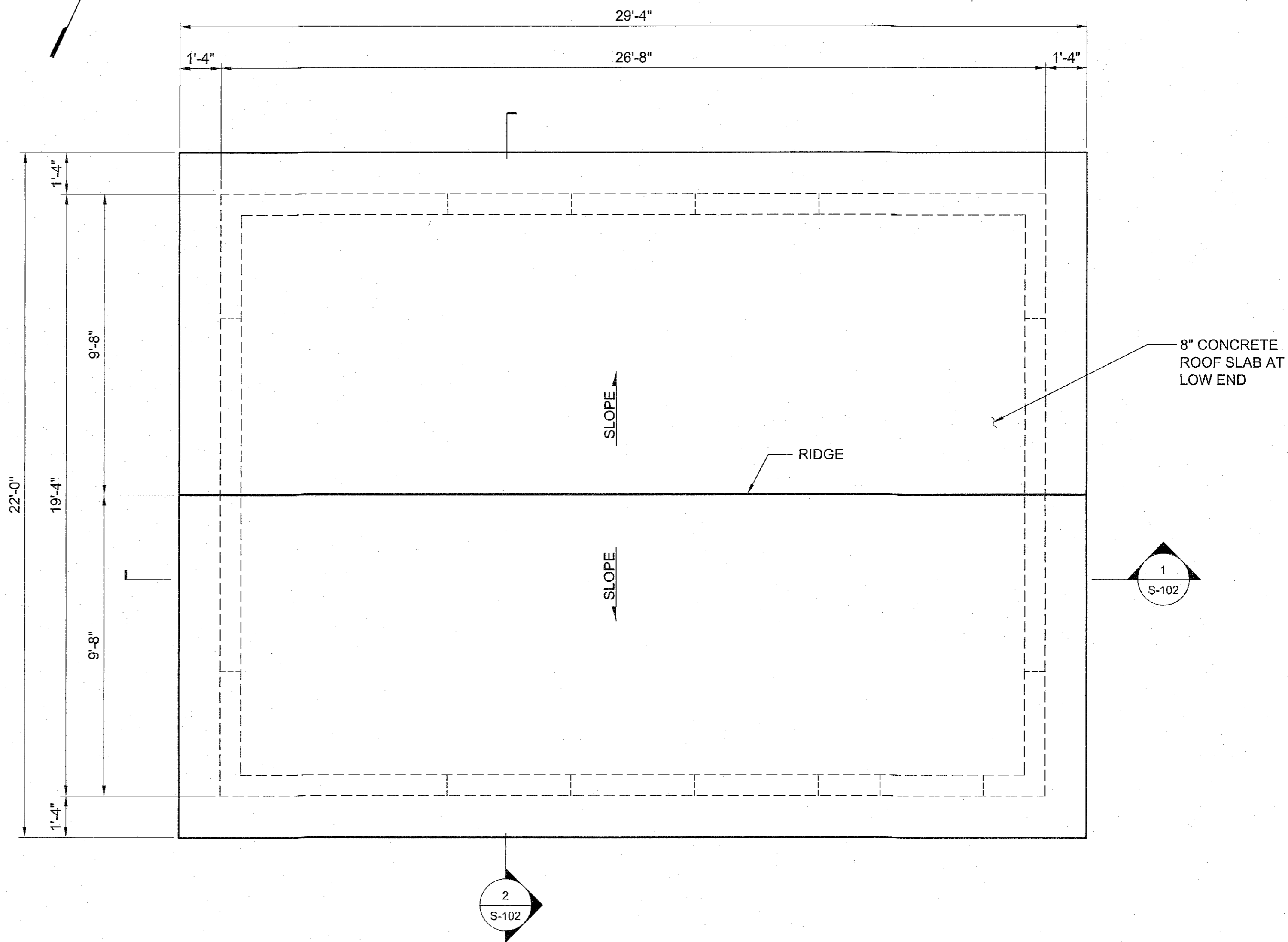
<p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.")</p> <p>BY <i>David E. McCleary</i> 4/30/20 11/6/2018 EXP DATE</p>	<p>LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)</p>	<table border="1"> <tr> <th>REVISION</th> <th>DATE</th> <th>BRIEF</th> <th>BY</th> <th>APPROVED</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISION	DATE	BRIEF	BY	APPROVED					
	REVISION	DATE	BRIEF	BY	APPROVED							
	<p>DEPARTMENT OF WATER COUNTY OF KAUAI</p> <p>JOB NO. WKK-03</p> <p>MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2 KĪLAUEA, KAUAI, HAWAII</p>											
<p>STANDARD DETAILS - 2</p> <p>DESIGNED BY <u>G.G.M</u> DRAWN BY <u>R.B.B.</u> CHECKED BY <u>D.E.M.</u></p> <p>APPROVED BY: <i>[Signature]</i> 3/11/19 DATE</p> <p>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</p>												
<p>SHEET 21 OF 60 SHEETS S-004</p>												

Path: P:\Projects\kauai, County Of (h)\150756 Kilauea Wells (McC Design)\400 Design\CADD\SHEETS\STRUCTURAL CAD\3-SHEETS\S-101.dwg Plot Date: November 14, 2018 - 1:37 PM CADD User: Yolanda Noda



FLOOR PLAN

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



ROOF PLAN

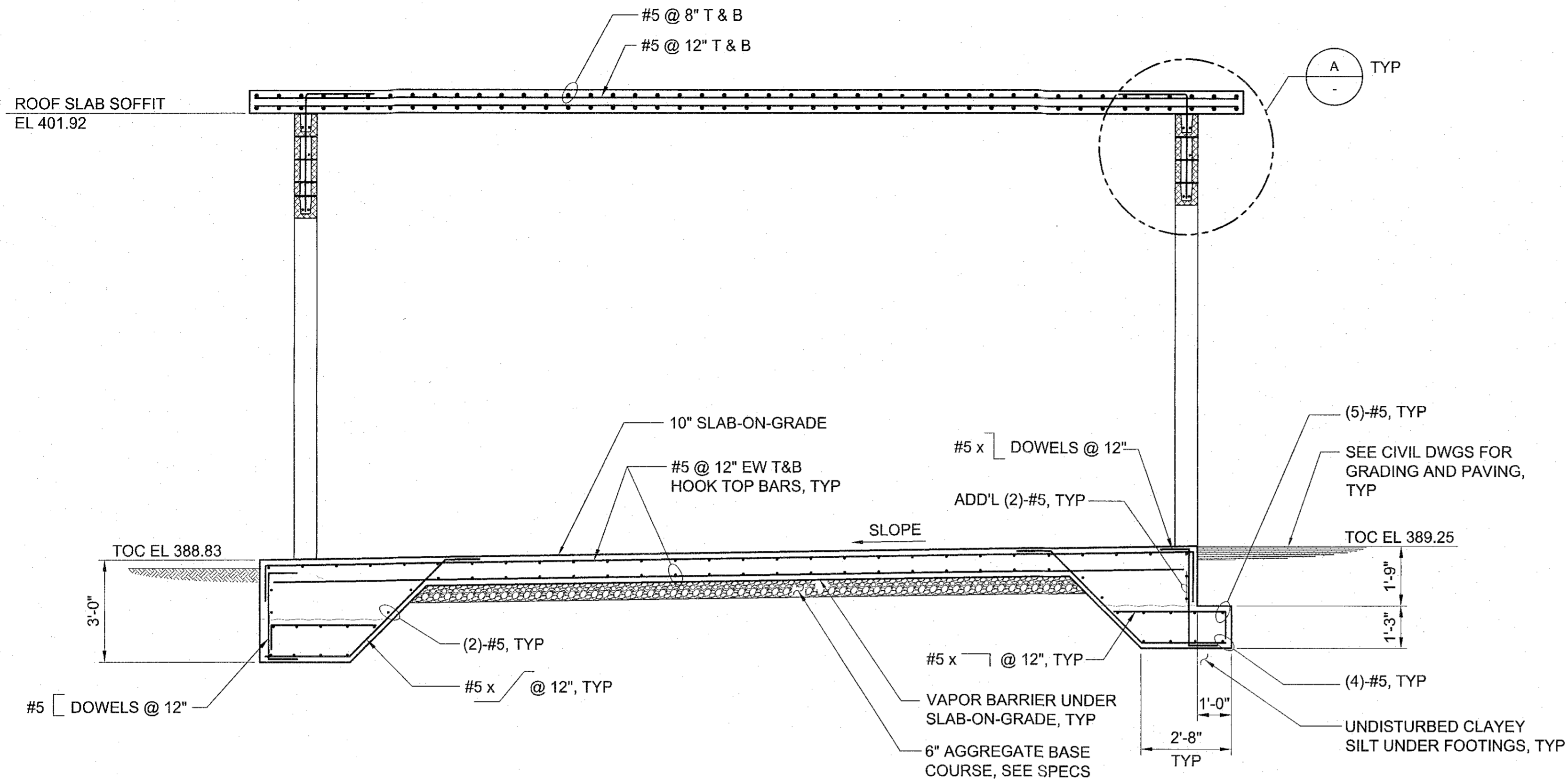
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NOTES:

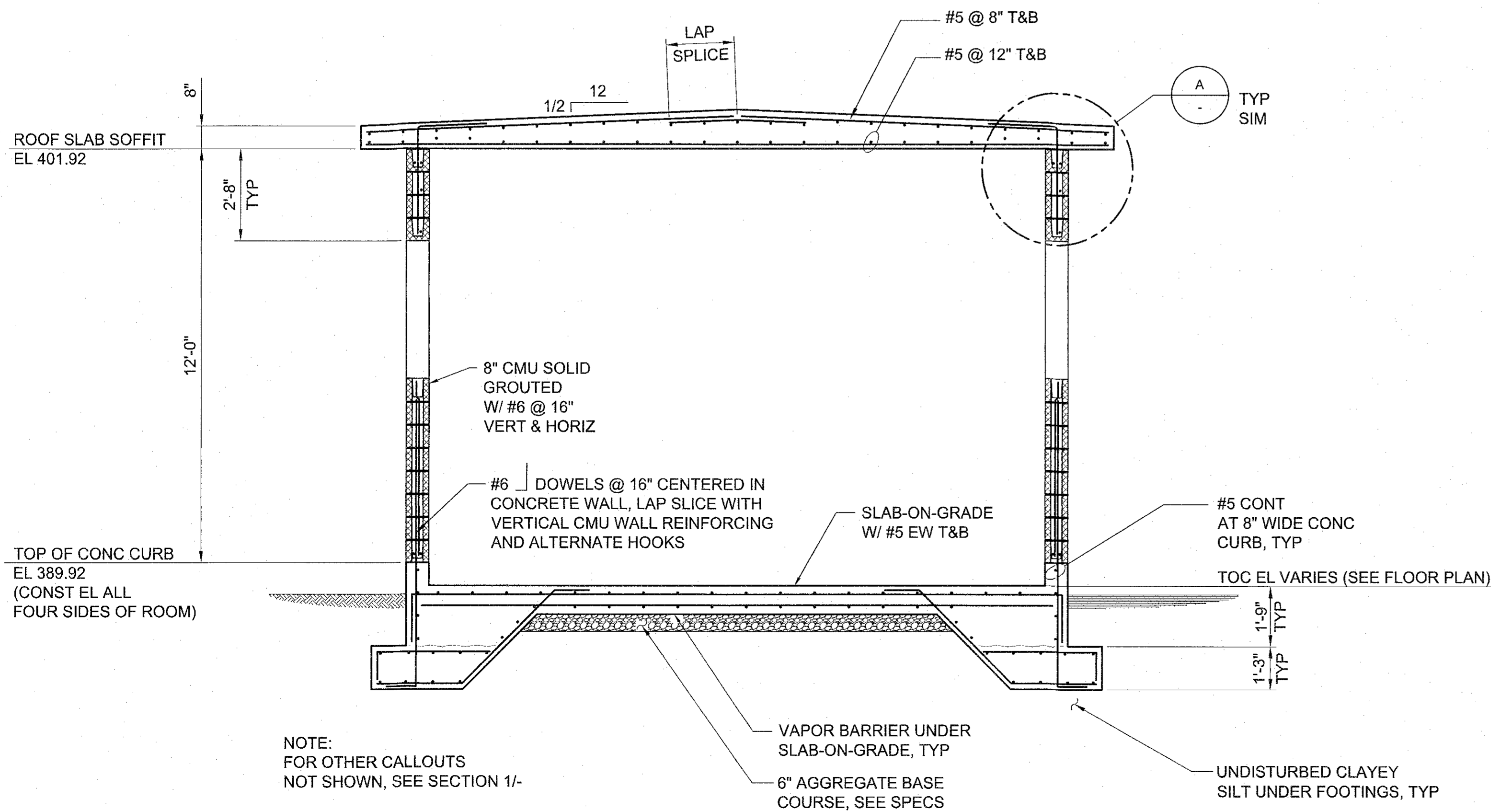
- REFER TO CIVIL DRAWING FOR BUILDING ORIENTATION AT EACH SITE.

<p>LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)</p> <p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.)</p> <p>BY <i>David E. McCleary</i> 4/30/20 EXP DATE 11/6/2018</p>	<p>REVISION</p> <table border="1"> <tr> <th>NO.</th> <th>DATE</th> <th>BY</th> <th>APPROVED</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	DATE	BY	APPROVED				
	NO.	DATE	BY	APPROVED					
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<p>GENERATOR SHELTER - FLOOR PLAN AND ROOF PLAN</p> <p>APPROVED BY: <i>[Signature]</i> 3/11/19 MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</p>	<p>SHEET 22 OF 60 SHEETS S-101</p>								

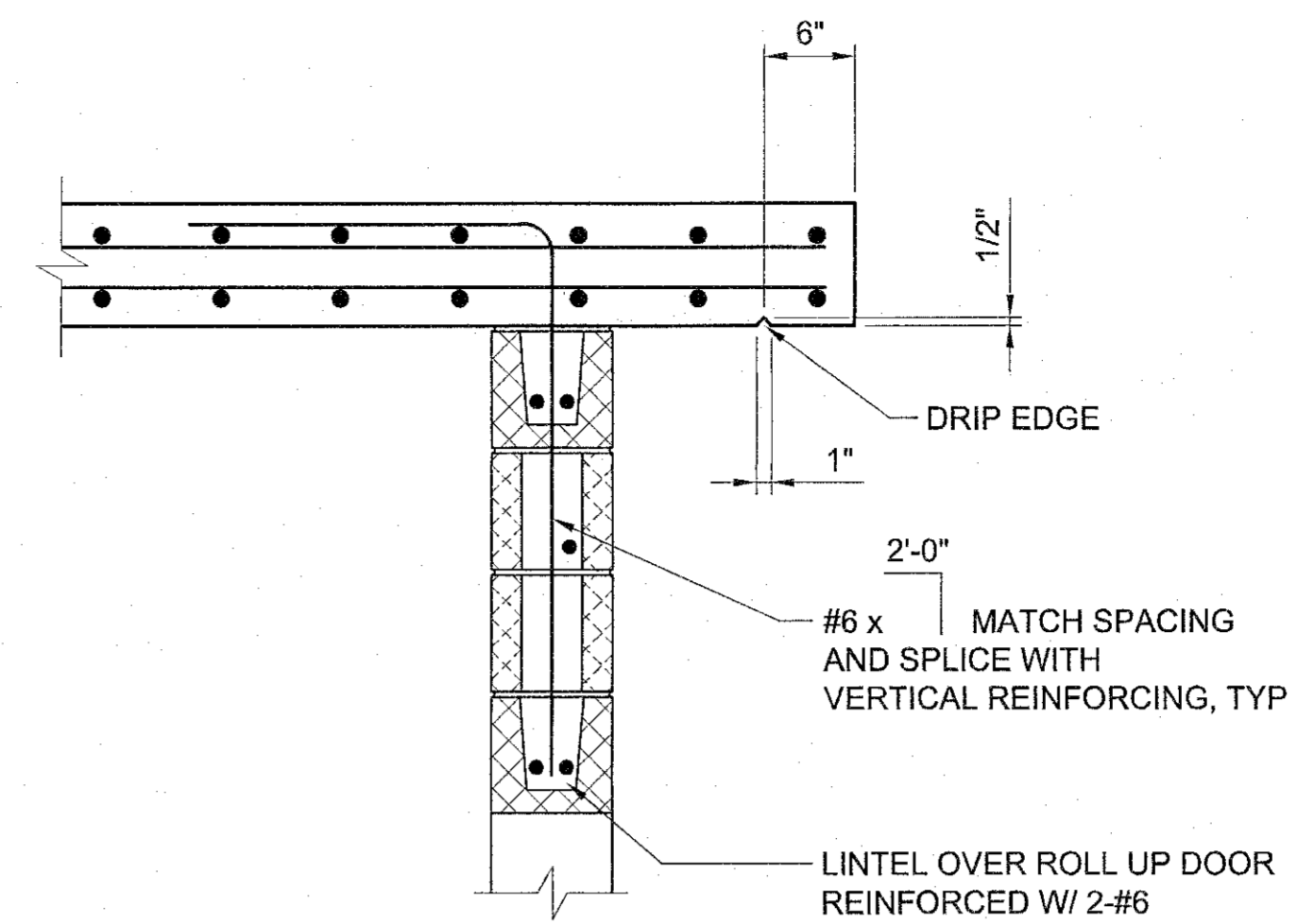
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1 SECTION
SCALE: 3/8" = 1'-0"



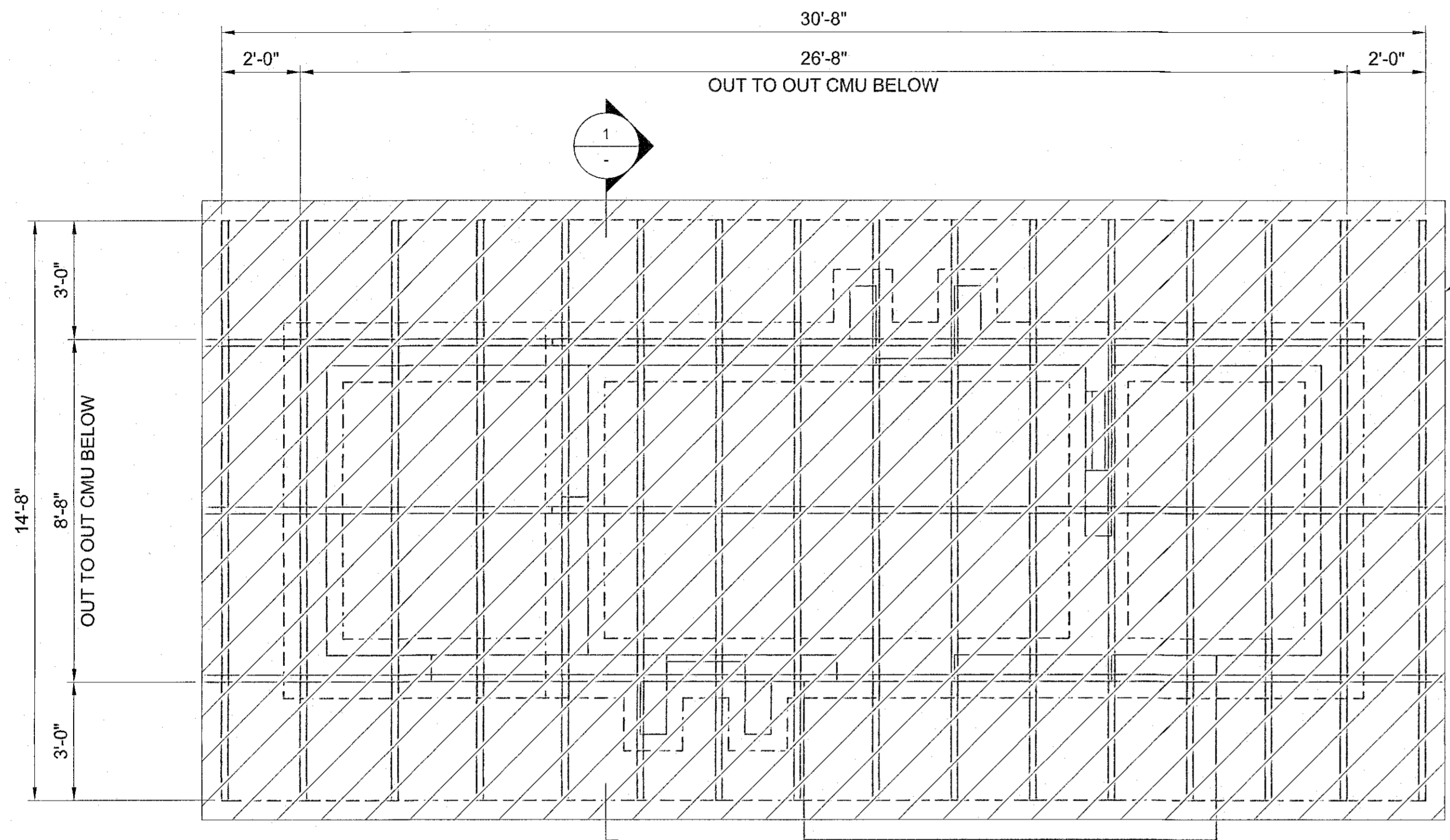
2 SECTION
SCALE: 3/8" = 1'-0"



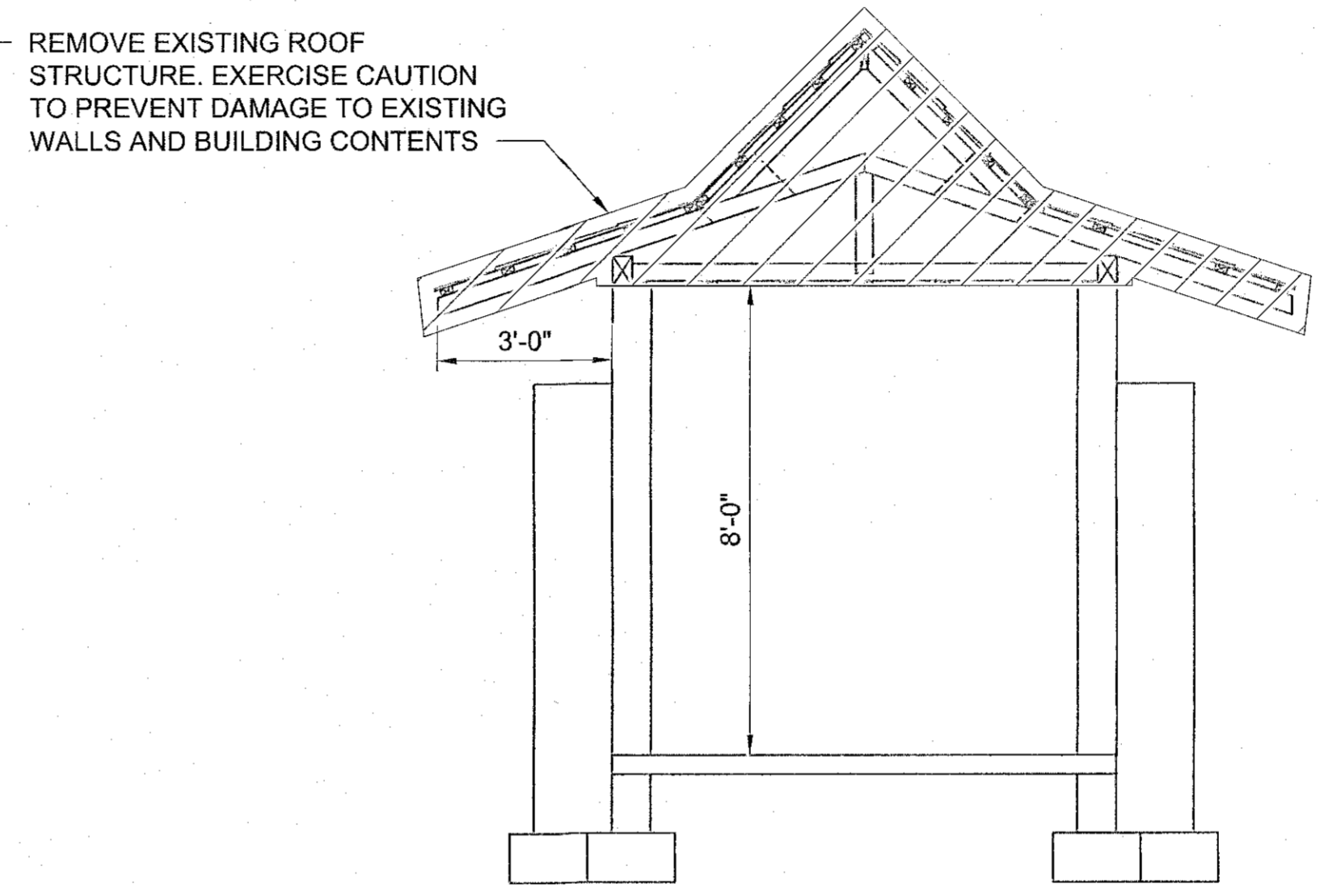
A DETAIL
SCALE: 1" = 1'-0"

<p>LINE IS 2 INCHES AT FULL SIZE (IF NOT 2'-SCALE ACCORDINGLY)</p> <p>DAVID E. MCCLEARY LICENSED PROFESSIONAL ENGINEER No. 12863-S HAWAII, U.S.A.</p> <p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.")</p> <p>BY <i>David E. McCleary</i> 4/30/20 11/17/2018 EXP DATE</p>	<table border="1"> <tr> <th>REVISION</th> <th>DATE</th> <th>BY</th> <th>APPROVED</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISION	DATE	BY	APPROVED				
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<p>DEPARTMENT OF WATER COUNTY OF KAUAI</p> <p>JOB NO. WKK-03</p> <p>MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII</p> <p>GENERATOR SHELTER - SECTIONS</p> <p>DESIGNED BY: <u>G.G.M.</u> DRAWN BY: <u>R.B.B.</u> CHECKED BY: <u>D.E.M.</u></p> <p>APPROVED BY: <i>[Signature]</i> 3/11/19 MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI DATE</p>	<p>SHEET 23 OF 60 SHEETS S-102</p>								

Path: \\hchcnf001\projects\Projects\Kauai, County Of (H)\150756 Kilauea Wells MCC Design\400 Design\CADD\2-SHEETS\STRUCTURAL File Name: 150756-S-201\150756-S-201.dwg Plot Date: January 22, 2019 - 3:21 PM CADD User: Rodney Blumenshine



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



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

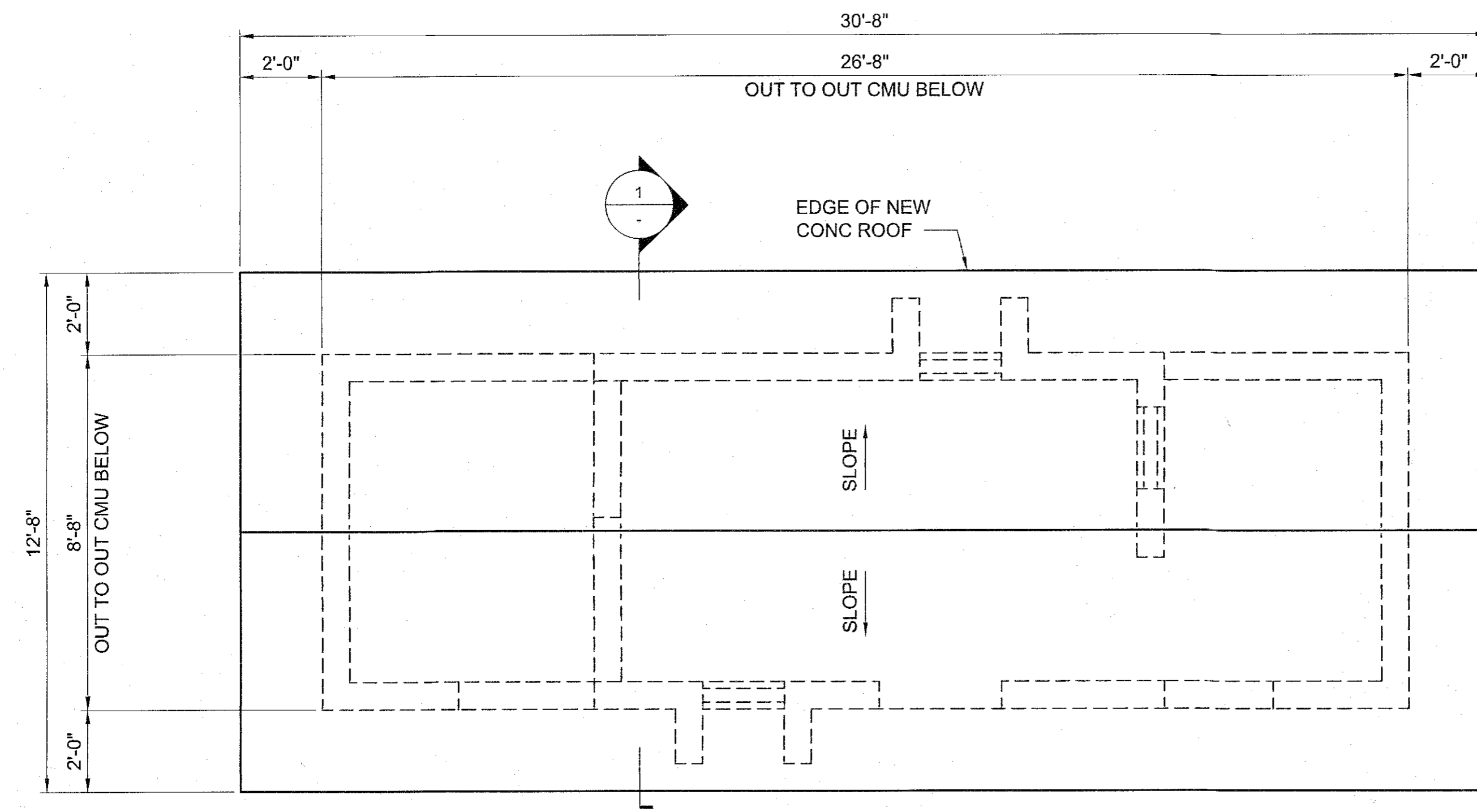
REMOVE EXISTING ROOF STRUCTURE. EXERCISE CAUTION TO PREVENT DAMAGE TO EXISTING WALLS AND BUILDING CONTENTS

<p>LINE IS 2 INCHES AT FULL SIZE (IF NOT 2'-SCALE ACCORDINGLY)</p> <p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.)</p>	<p>DESIGNED BY: J.A.S. DRAWN BY: E.A.B. CHECKED BY: D.E.M.</p>
	<p>APPROVED BY: <i>[Signature]</i> DATE: 3/11/19</p> <p>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</p>
	<p>BY: _____ 4/30/20 EXP DATE</p>
	<p>SHEET 24 OF 60 SHEETS S-201</p>

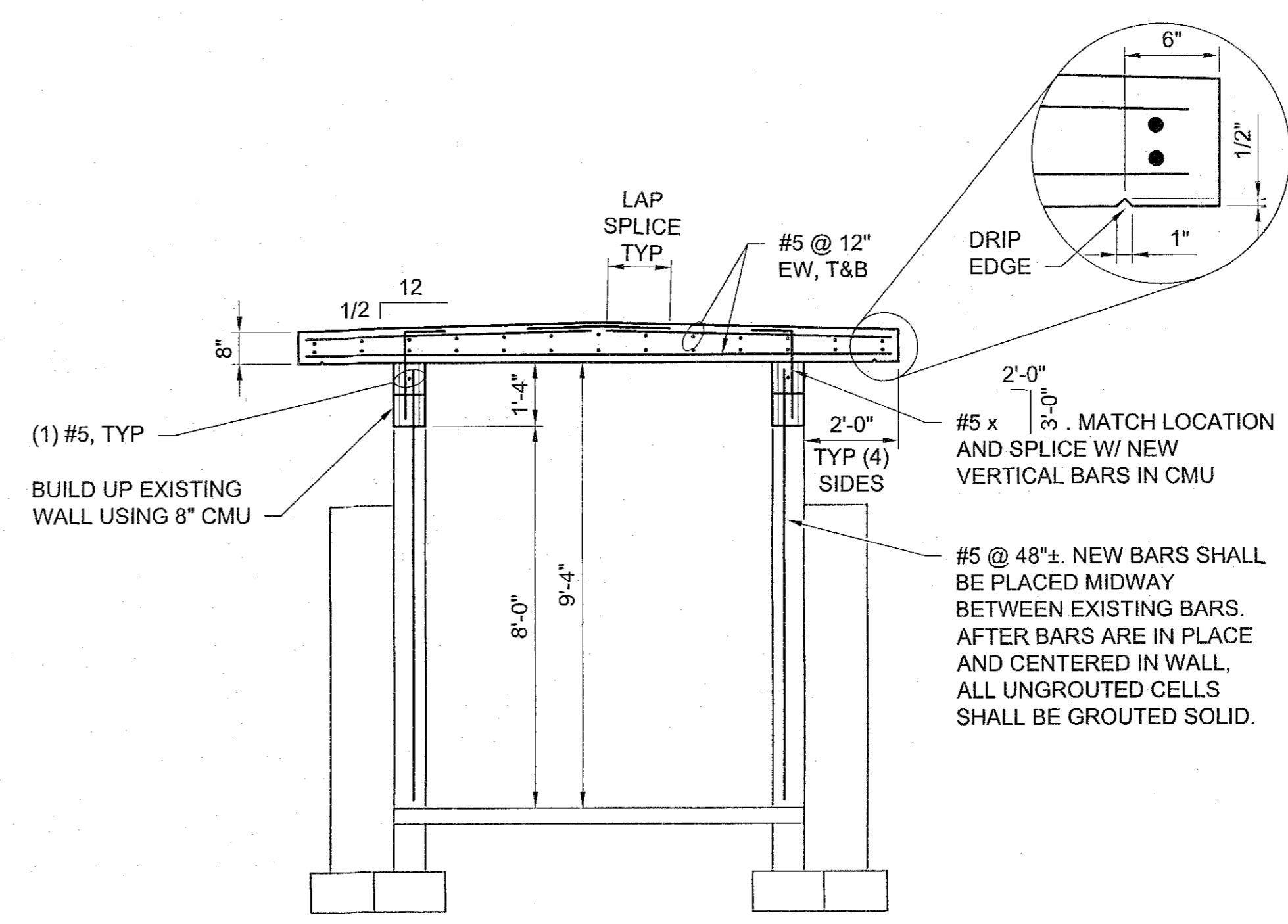
DEPARTMENT OF WATER
COUNTY OF KAUAI
JOB NO. WKK-03
MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2
KILAUEA, KAUA'I, HAWAII

EXISTING PUMP CONTROL BUILDING
EXISTING/DEMOLITION PLANS

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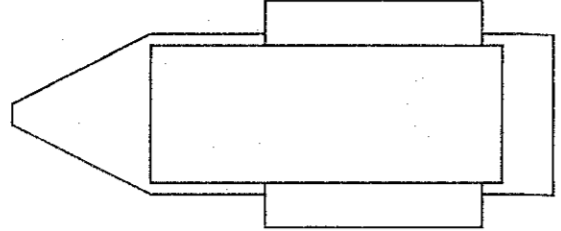
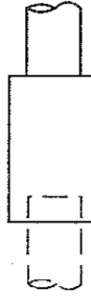
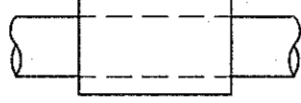


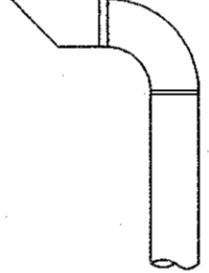
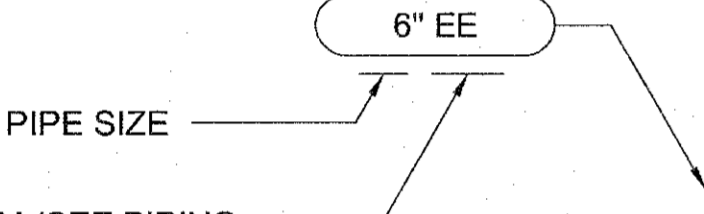
ROOF PLAN
SCALE: 3/8" = 1'-0"

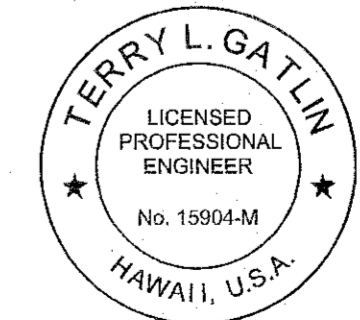

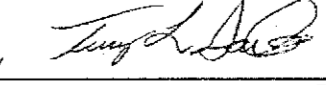


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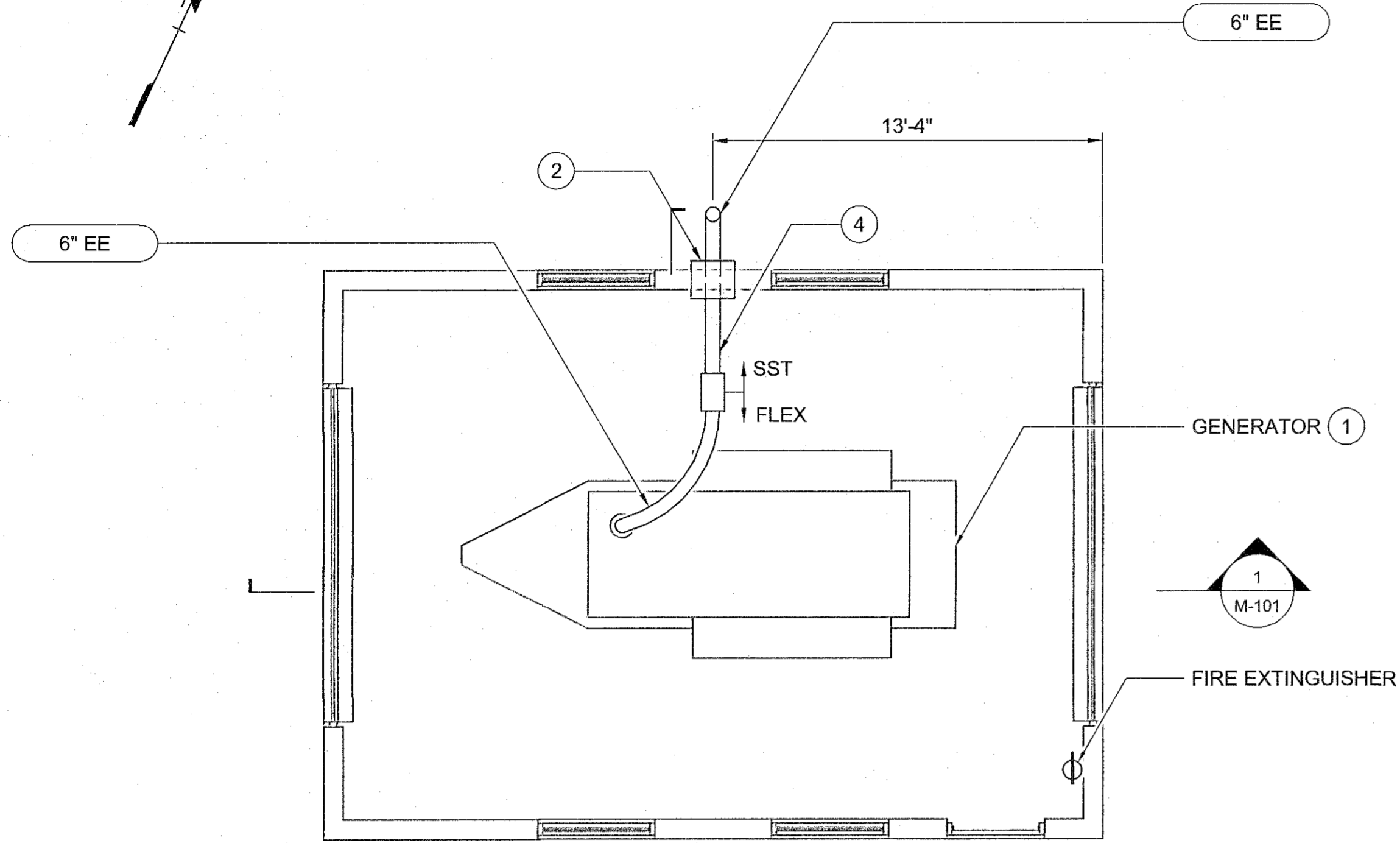
<p>LINE IS 2 INCHES AT FULL SIZE (IF NOT 2'-SCALE ACCORDINGLY)</p> <p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, *PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.*)</p>	<p>DEPARTMENT OF WATER COUNTY OF KAUAI</p>				
	<p>JOB NO. WKK-03</p>				
	<p>MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII</p>				
	<p>EXISTING PUMP CONTROL BUILDING NEW ROOF CONSTRUCTION</p>				
DESIGNED BY	J.A.S.	DRAWN BY	E.A.B.	CHECKED BY	J.A.S.
APPROVED BY:				DATE	3/11/19
BY				EXP DATE	4/30/20
SHEET 25 OF 60 SHEETS		S-202			

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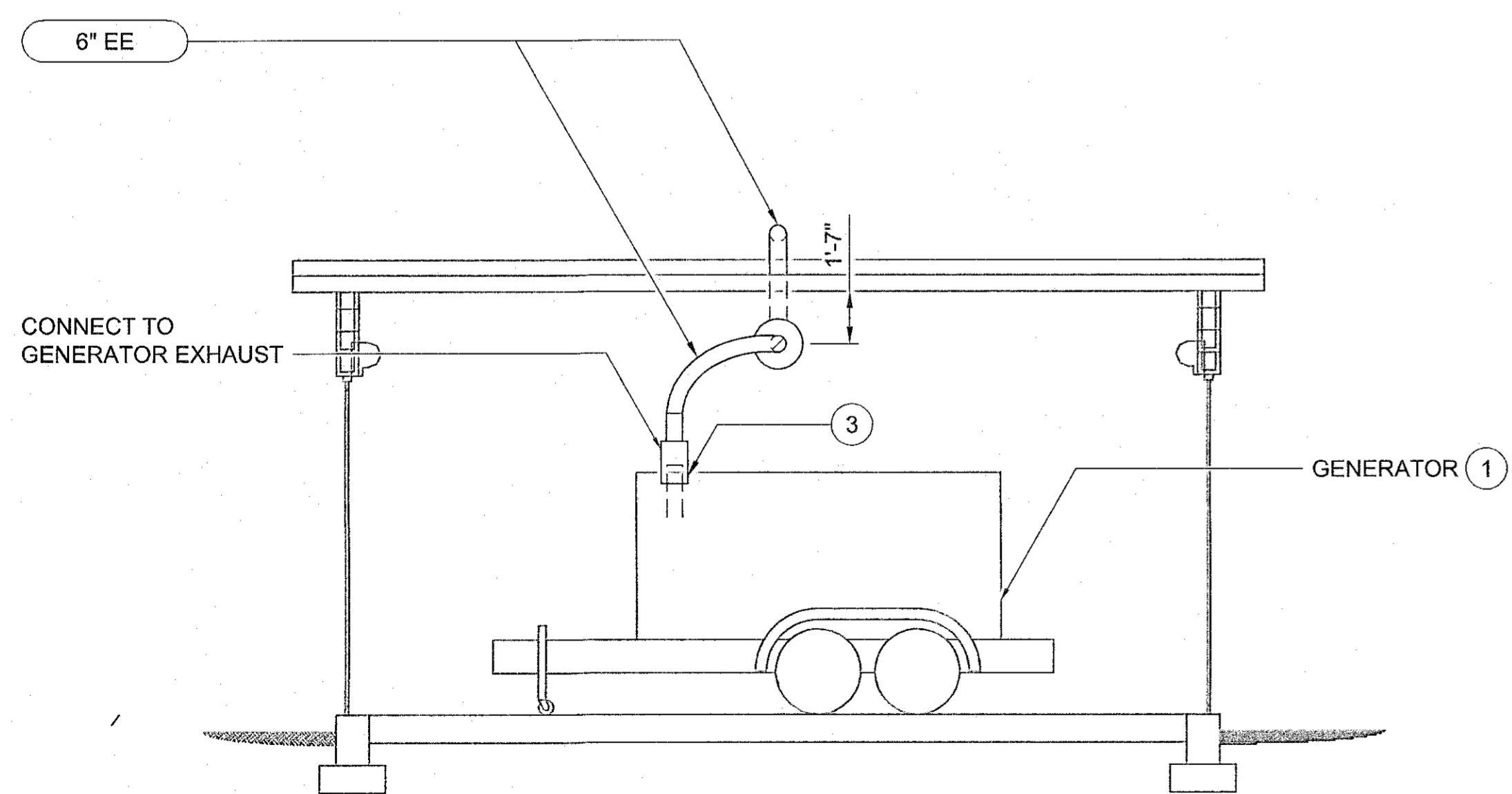
GENERAL NOTES	SYMBOLS															
<p>1. THIS DRAWING IS GENERAL IN NATURE. SOME DESIGNATIONS SHOWN HEREON MAY NOT BE USED ON THE CONTRACT DRAWINGS.</p> <p>2. SEE PIPING SPECIFICATION SHEETS (PIPE SPECS) IN SPECIFICATION SP-07.1 FOR PIPING SYSTEM REQUIREMENTS.</p> <p>3. THE MECHANICAL DRAWINGS REPRESENT THE ACTUAL PIPING AND EQUIPMENT LAYOUT AND LOCATIONS. MINOR CHANGES OF LESS THAN 1" IN ANY DIRECTION ARE ACCEPTABLE. CHANGES OF LARGER MAGNITUDE MUST BE APPROVED BY THE ENGINEER.</p> <p>4. ALL FASTENERS TO BE 316 STAINLESS STEEL UNLESS NOTED OTHERWISE.</p>	<div style="display: flex; align-items: center; margin-bottom: 10px;">  <div style="margin-left: 10px;">EXISTING GENERATOR</div> </div> <div style="display: flex; align-items: center; margin-bottom: 10px;">  <div style="margin-left: 10px;">QUICK DISCONNECT</div> </div> <div style="display: flex; align-items: center; margin-bottom: 10px;">  <div style="margin-left: 10px;">WALL THIMBLE</div> </div> <div style="display: flex; align-items: center; margin-bottom: 10px;">  <div style="margin-left: 10px;">EXHAUST PIPE</div> </div> <div style="display: flex; align-items: center; margin-bottom: 10px;">  <div style="margin-left: 10px;">BALL VALVE</div> </div> <div style="display: flex; align-items: center;">  <div style="margin-left: 10px;">EXHAUST STACK (GOOSENECK)</div> </div>															
<p>PIPING SYSTEMS</p>																
<p>PIPING SYSTEMS ARE CALLED OUT BY SIZE FOLLOWED BY PIPING SYMBOL, ENCLOSED AS SHOWN.</p>																
																
<p>PIPE SIZE</p> <p>PIPING SYSTEM (SEE PIPING SYMBOLS IN SECTION 7)</p>																
<p>ABBREVIATIONS</p>																
<table style="width: 100%; border-collapse: collapse;"> <tr><td style="width: 50px;">EE</td><td>ENGINE EXHAUST</td></tr> <tr><td>FLEX</td><td>FLEXIBLE HOSE</td></tr> <tr><td>SST</td><td>STAINLESS STEEL</td></tr> <tr><td>OD</td><td>OUTSIDE DIAMETER</td></tr> <tr><td>THK</td><td>THICK</td></tr> <tr><td>TYP</td><td>TYPICAL</td></tr> <tr><td>FB</td><td>FLAT BAR</td></tr> </table>	EE	ENGINE EXHAUST	FLEX	FLEXIBLE HOSE	SST	STAINLESS STEEL	OD	OUTSIDE DIAMETER	THK	THICK	TYP	TYPICAL	FB	FLAT BAR		
EE	ENGINE EXHAUST															
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	<p>DEPARTMENT OF WATER COUNTY OF KAUAI</p> <p>JOB NO. WKK-03</p> <p>MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII</p>								
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<p>MECHANICAL NOTES AND SYMBOLS</p>									
<p>DESIGNED BY: <u>TLG</u> DRAWN BY: <u>GV</u> CHECKED BY: <u>JAN</u></p>									
<p>APPROVED BY:  DATE: <u>3/11/19</u></p>									
<p>BY:  4/30/20 EXP DATE</p>									
<p>SHEET 26 OF 60 SHEETS M-001</p>									

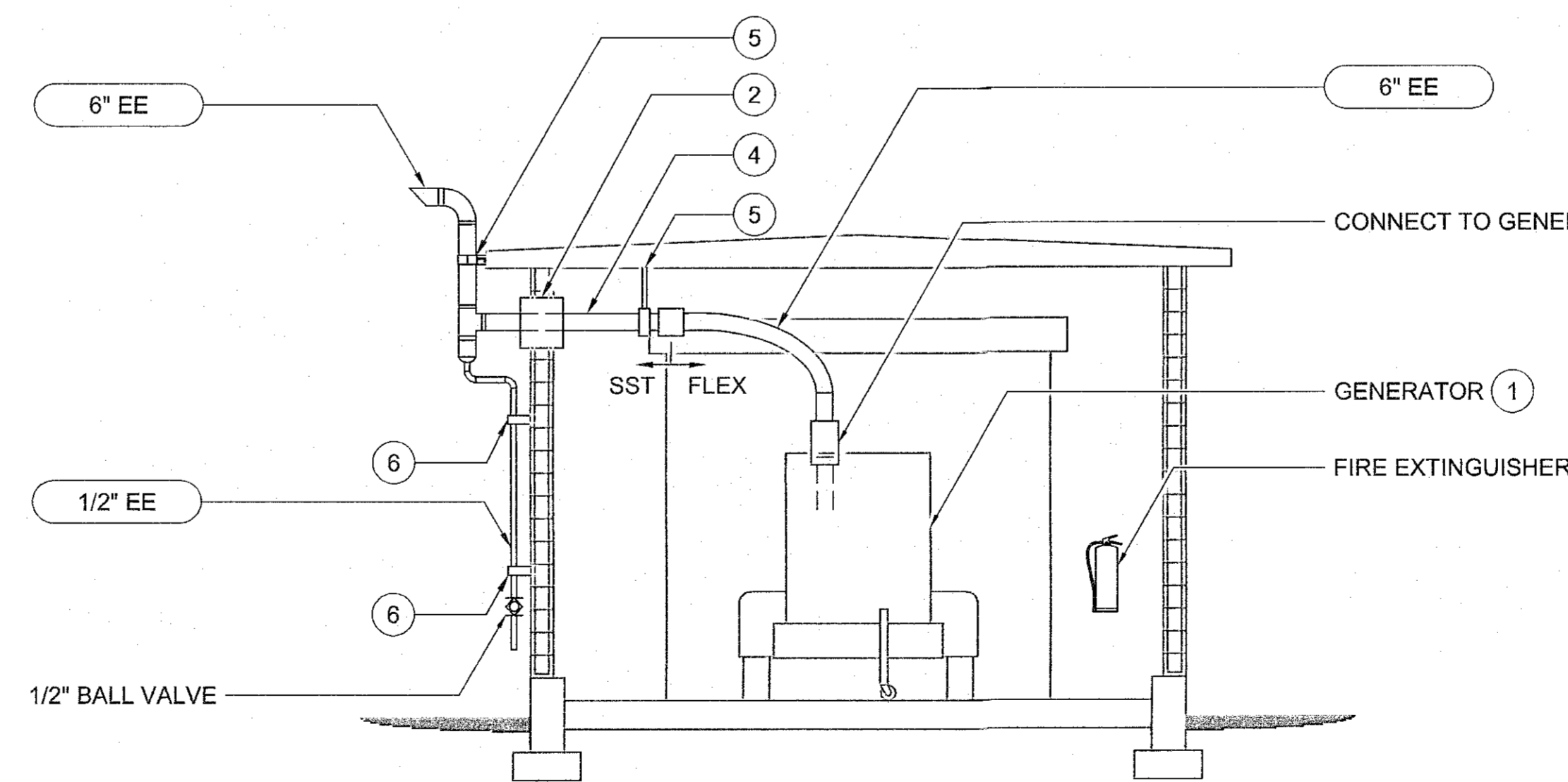
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FLOOR PLAN
SCALE: 1/4" = 1'-0"



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



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

KEY NOTES:

- 1 MULTIQIP WHISPERWATT MODEL DCA-150SSM. BY OWNER.
- 2 FOR WALL THIMBLE INSTALLATION AT WALL, SEE DETAIL B ON DRAWING M-102.
- 3 EXHAUST QUICK DISCONNECT, SEE DETAIL C ON DRAWING M-102.
- 4 INSULATE HARD PIPE WITH 2" MINERAL WOOL INSIDE THE STRUCTURE.
- 5 FOR EXHAUST SUPPORT, SEE DETAIL A ON DRAWING M-102.
- 6 SUPPORT EE DRAIN SIMILAR TO DETAIL A ON DRAWING M-102. OMIT CENTER BRACE AND ANCHOR BOLT.

FIRE EXTINGUISHER NOTES:

1. PROVIDE A MINIMUM WARRANTY PERIOD OF 5 YEARS FROM DATE OF SUBSTANTIAL COMPLETION. WARRANTY TO INCLUDE MANUFACTURER'S AGREEMENT TO REPAIR OR REPLACE FIRE EXTINGUISHERS THAT FAIL IN MATERIAL OR WORKMANSHIP.
2. FIRE EXTINGUISHER: PROVIDE CLEAN-AGENT TYPE IN STEEL CONTAINER: UL-RATED 2-A:10-B:C 10-LB NOMINAL CAPACITY, WITH HFC BLEND AGENT AND INERT MATERIAL IN ENAMELED-STEEL CONTAINER; WITH PRESSURE INDICATING GAGE.
3. INCLUDE PICTORAL MARKING SYSTEM COMPLYING WITH NFPA 10, APPENDIX B, AND BAR CODING FOR DOCUMENTING FIRE EXTINGUISHER LOCATION, INSPECTIONS, MAINTENANCE, AND RECHARGING. PROPER IDENTIFICATION TO MEET IBC 2009 REQUIREMENTS.
4. MOUNTING BRACKETS:
 - a. MFR STD GALVANIZED STEEL DESIGNED TO SECURE EXTINGUISHER TO WALL, WITH PLATED OR BAKED ENAMEL FINISH.
 - b. IDENTIFICATION: LETTERING COMPLYING WITH AHJ FOR LETTER STYLE, SIZE, SPACING, AND LOCATION. IDENTIFY WITH THE WORDS "FIRE EXTINGUISHER" IN RED LETTER DECALS APPLIED TO MOUNTING SURFACE. ORIENTATION TO BE HORIZONTAL.
 - c. FASTEN MOUNTING BRACKETS TO SURFACES, SQUARE AND PLUMB.
5. FIRE EXTINGUISHER TO BE MOUNTED 54 INCHES ABOVE FINISHED FLOOR TO TOP OF FIRE EXTINGUISHER.

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

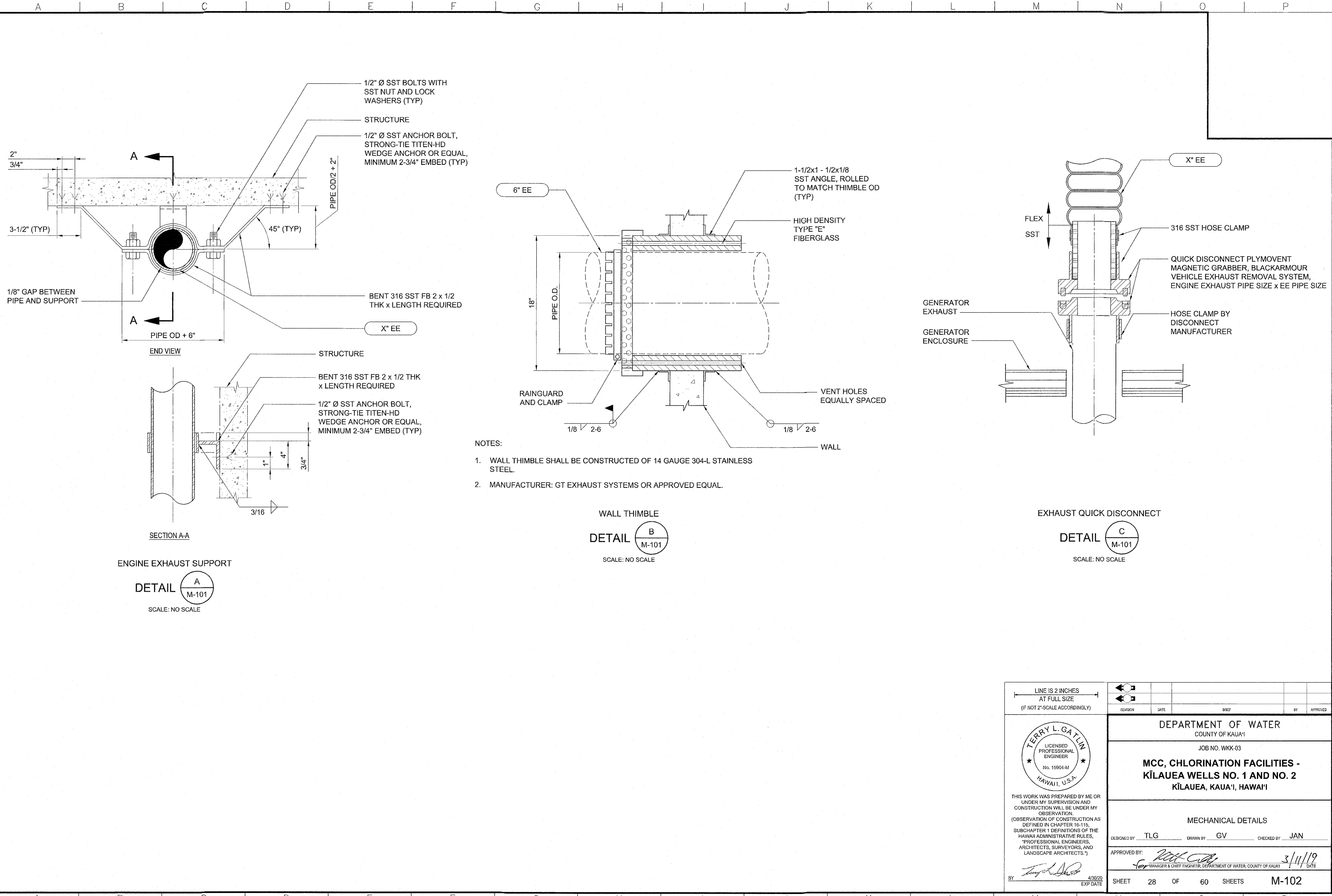
TERRY L. GATLIN
 LICENSED PROFESSIONAL ENGINEER
 No. 15904-M
 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION.
 (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, *PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.*)

BY: *Terry L. Gatlin* 4/30/20 EXP DATE

REVISION	DATE	SHEET	BY	APPROVED
DEPARTMENT OF WATER COUNTY OF KAUAI JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII				
GENERATOR SHELTER FLOOR PLAN AND SECTIONS				
DESIGNED BY	TLG	DRAWN BY	GV	CHECKED BY
				JAN
APPROVED BY:	<i>Michael...</i>			3/11/19
	MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI			DATE
SHEET	27	OF	60	SHEETS
				M-101

Path: \\bchorn001\projects\Projects\Kauai\ County Of (HI)\50756 Kilauea Wells MCC Design\400 Design\CADD\2-SHEETS\M-MECHANICAL Files\m-102-M-102.dwg Pld Date: November 12, 2018 - 4:27 PM CADD User: Terry Gatlin



ENGINE EXHAUST SUPPORT

DETAIL **A**
M-101
SCALE: NO SCALE

- NOTES:
1. WALL THIMBLE SHALL BE CONSTRUCTED OF 14 GAUGE 304-L STAINLESS STEEL.
 2. MANUFACTURER: GT EXHAUST SYSTEMS OR APPROVED EQUAL.

WALL THIMBLE
DETAIL **B**
M-101
SCALE: NO SCALE

EXHAUST QUICK DISCONNECT
DETAIL **C**
M-101
SCALE: NO SCALE

<p>LINE IS 2 INCHES AT FULL SIZE (IF NOT 2'-SCALE ACCORDINGLY)</p> <p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, *PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.*)</p> <p>BY: <i>Terry L. Gatlin</i> 4/30/20 EXP DATE</p>	<p>REVISION</p> <table border="1"> <tr> <th>NO.</th> <th>DATE</th> <th>BY</th> <th>APPROVED</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	DATE	BY	APPROVED				
	NO.	DATE	BY	APPROVED					
	<p>DEPARTMENT OF WATER COUNTY OF KAUAI</p> <p>JOB NO. WKK-03</p> <p>MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII</p>								
<p>MECHANICAL DETAILS</p> <p>DESIGNED BY: TLG DRAWN BY: GV CHECKED BY: JAN</p> <p>APPROVED BY: <i>Terry L. Gatlin</i> 3/11/19 DATE</p> <p>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</p>									
<p>SHEET 28 OF 60 SHEETS M-102</p>									

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PLAN SYMBOLS

RACEWAY IDENTIFIER
#SETS, 2-1/2" (3#3/0, 1#4GND)

RACEWAY EXPOSED MODIFIERS FOR RACEWAY TYPE:
 P - POWER
 C - CONTROL
 S - SIGNAL
 D - DATA
 F - OPTICAL FIBER

NUMBER OF CONDUIT/ CONDUCTOR SETS (ONLY IF >1)
 CONDUIT TRADE SIZE
 CONDUCTOR QUANTITY AND SIZE (AWG)

----- RACEWAY CONCEALED

○ RACEWAY TURNED TOWARD THE VIEWER.

● RACEWAY TURNED DOWN

LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT

--- DB --- CONCRETE DUCTBANK

--- RC --- REINFORCED CONCRETE DUCTBANK

JB-XXXX JUNCTION BOX. OPTIONAL IDENTIFIER.

T TERMINAL BOX

PNL-A - 1,3,5 HOME RUN EXPOSED - SEE PANELBOARD, SWITCHBOARD, OR MCC SCHEDULE FOR CIRCUIT INFORMATION.
 EXAMPLE: TO PANEL PNL-A, CIRCUITS 1, 3, AND 5.

PNL-A - 1,3,5 HOME RUN CONCEALED - SEE PANELBOARD, SWITCHBOARD, OR MCC SCHEDULE FOR CIRCUIT INFORMATION.
 EXAMPLE: TO PANEL PNL-A, CIRCUITS 1, 3, AND 5.

EXISTING TELECOMMUNICATIONS DUCT BANK SHOWN ON EXISTING DRAWING

EXISTING ELECTRICAL DUCT BANK SHOWN ON EXISTING DRAWING

--- E --- NEW WIRE IN EXISTING CONDUIT

ITEM TO BE REMOVED

INTERCEPT AND EXTEND EXISTING CONDUIT

LIGHTING

FIXTURE IDENTIFIER:

NUMBER OF FIXTURES (SHOWN ONLY WHEN REQUIRED FOR CLARITY)

FIXTURE TYPE. REFER TO LIGHT SPEC. TYPE APPLIES TO ALL FIXTURES OF THE SAME SHAPE WITHIN A ROOM OR AREA.

MOUNTING:
 L = POLE R = RECESSED
 G = GROUND S = SURFACE
 P = PENDANT W = WALL

MOUNTING HEIGHT, FLOOR TO BOTTOM OF FIXTURE.
 AHAP= AS HIGH AS POSSIBLE.
 NUMBER OF LAMPS/LAMP WATTAGE
 CONTROL: PHOTOCELL (PC), SWITCH (SW)

LAY-IN FLUORESCENT FIXTURE

COMBINATION EXIT SIGN AND EMERGENCY LIGHTING UNIT. SELF CONTAINED.

3a CIRCUIT IDENTIFIER: WHEN SHOWN ADJACENT TO FIXTURE IDENTIFIES CIRCUIT NUMBER AND SWITCH.
 EXAMPLE: CIRCUIT 3, CONTROLLED BY SWITCH a.

POLE MOUNTED AREA LIGHT

WALL MOUNTED LIGHT

PHOTOCELL

MOTORS AND EQUIPMENT

HHXX HANDHOLE (HH)

F 60/3/40 DISCONNECT SWITCH, FUSED
 EXAMPLE: 60 AMP, 3 POLE, 40 AMP FUSES

F 60/3 DISCONNECT SWITCH, NON-FUSED
 EXAMPLE: 60 AMP, 3 POLE

M MOTOR

T THERMOSTAT

H HEATER

⊗ FIELD INSTRUMENT

KWH POWER METER (KILOWATT HOUR)

CONTROL PANEL

PNL XXX EQUIPMENT DESIGNATION

SV SOLENOID VALVE

LS LIMIT SWITCH

WIRING DEVICES

SWITCHES:
 UNLESS OTHERWISE NOTED, ALL SWITCHES ARE WALL MOUNTED.

TOGGLE SWITCH, SINGLE POLE, OR INSTRUMENT DISCONNECT

SUPERSCRIPIT INDICATES CIRCUIT CONTROLLED: a, b, c, ETC. MAY BE COMBINED WITH CIRCUIT NUMBER.
 EXAMPLE: 1a, 4b, ETC.

SUBSCRIPT MODIFIER INDICATES:
 3 = THREE WAY
 WPR = WEATHER PROOF COVER
 M = MOTOR RATED

RECEPTACLES:
 UNLESS OTHERWISE NOTED, ALL RECEPTACLES ARE 125 VOLT, 20A, SINGLE PHASE, STRAIGHT BLADE, NON-LOCKING, GROUNDING STYLE.

Ⓛ DUPLEX RECEPTACLE, 20 AMP, 3 WIRE

RECEPTACLE MODIFIERS:
 WPR = WEATHER PROOF
 GF = GROUND FAULT CIRCUIT INTERRUPTER

DISTRIBUTION EQUIPMENT

APPROXIMATE SHAPE AND SCALE REPRESENTED WHERE POSSIBLE. HOWEVER, EXACT SIZE AND NUMBER OF SECTIONS IS ESTIMATED.

FLOOR-STANDING DISTRIBUTION ASSEMBLY, SUCH AS A SWITCHBOARD, TRANSFORMER, OR MOTOR CONTROL CENTER

MCC XXX EQUIPMENT DESIGNATION

WALL-MOUNTED DISTRIBUTION ASSEMBLY, SUCH AS PANEL, MOTOR STARTER PANEL, OR TERMINAL CABINET

PNL XXX EQUIPMENT DESIGNATION

SINGLE LINE DIAGRAM SYMBOLS

INCOMING LINE

BUS

CABLE CONDUCTOR

DRAWOUT MECHANISM

5 KVA PACKAGED EQUIPMENT OR NON-MOTOR LOAD. KVA, KW, AMPS AS NOTED.

RVSS REDUCED-VOLTAGE SOLID-STATE SOFT STARTER

5 HP MOTOR, HORSEPOWER SHOWN

DISCONNECT OR ISOLATING SWITCH. 200 AMP SHOWN

MOLDED CASE CIRCUIT BREAKER (TYPE: MCP = MOTOR CIRCUIT PROTECTOR OR 3P = 3-POLE THERMAL MAGNETIC TRIP. SUSE = SUITABLE FOR USE AS SERVICE ENTRANCE)

FUSE. 100 AMP, CLASS "F" SHOWN (FUSE CLASS OPTIONAL)

FUSED DISCONNECT SWITCH: AMPERE RATING, NUMBER POLES, FUSE RATING, AND TYPE AS SHOWN.
 CLF = CURRENT-LIMITING FUSE
 DE = DUAL-ELEMENT
 F = CLASS F
 E = E-RATED

100 KVA 13.2 KV POWER TRANSFORMER. VOLTAGES, SIZE, IMPEDANCE SHOWN
 5.75% Z 480/277 V

480:120V POTENTIAL TRANSFORMER. PT QUANTITY (3) AND VOLTAGES SHOWN

400/5 CURRENT TRANSFORMER. CT QUANTITY (3) AND 400:5 TURNS RATIO SHOWN

WINDING CONFIGURATIONS:
 DELTA
 WYE (GROUNDED)

SPD SURGE PROTECTIVE DEVICE

55 KVAR POWER FACTOR CORRECTION CAPACITOR. KVAR RATING INDICATED

GROUNDING

GROUND ROD

GROUND ROD WITH TEST WELL

GROUND CONNECTION, COMPRESSION TYPE, EXOTHERMIC. SEE SPECIFIC REQUIREMENTS.

GROUNDING CONDUCTOR

GROUND CONNECTION

GENERAL NOTES:

- PLANS DO NOT INDICATE COMPLETE EXISTING ELECTRICAL CONDITIONS. CONTRACTOR SHALL VISIT JOB SITE TO BECOME FAMILIAR WITH ALL EXISTING CONDITIONS AND EXTENT OF REMOVAL AND NEW WORK PRIOR TO THE START OF CONSTRUCTION.
- AS A CONDITION OF BIDDING, THE CONTRACTOR SHALL BE REQUIRED TO ATTEND THE PRE-BID SITE VISIT SCHEDULED BY DOW. AT THIS TIME, THE CONTRACTOR SHALL HAVE THE OPPORTUNITY TO EXAMINE EXISTING SITE CONDITIONS AND SHALL REPORT ANY DISCREPANCIES AND/OR DIFFERENCES IN DRAWINGS, WITH RESPECT TO EXISTING CONDITIONS, TO DOW.
- PROVIDE ALL WIRING AND CONNECTIONS, PER NEC REQUIREMENTS, TO ENSURE CONTINUITY OF ELECTRICAL EQUIPMENT TO REMAIN IN USE, AT NO ADDITIONAL COST TO THE DOW.
- THE CONTRACTOR SHALL DEVELOP A DETAILED WORK SEQUENCING PLAN IDENTIFYING THE ORDER IN WHICH WORK MUST BE PERFORMED TO MEET DOW'S OPERATIONAL REQUIREMENTS THROUGHOUT CONSTRUCTION. THE CONTRACTOR SHALL SUBMIT THIS WORK SEQUENCING PLAN TO DOW FOR REVIEW AND APPROVAL PRIOR TO THE START OF CONSTRUCTION. REFER TO THE DETAILED WORK SEQUENCING REQUIREMENTS PROVIDED ON DWG E-006.
- BEFORE ANY ELECTRICAL WIRING IS CUT, CONTRACTOR SHALL VERIFY USAGE OF WIRING TO ENSURE THAT REQUIRED SERVICES ARE NOT DISCONTINUED.
- PRIOR TO REPLACEMENT, ALL RECEPTACLES, LIGHT SWITCHES, AND LIGHT FIXTURES SHALL BE TESTED FOR OPERATING CONDITION OF THE EXISTING CIRCUITS. NON-OPERATING CIRCUITS SHALL BE REPORTED TO THE DOW.
- REMOVE ALL EXISTING EXPOSED CONDUIT AND WIRES NOT TO REMAIN IN SERVICE; CONCEALED RACEWAYS NO LONGER REQUIRED SHALL BE CUT, CAPPED AND ABANDONED IN PLACE WITH ALL WIRES REMOVED.
- PROVIDE METAL SEALS FOR ALL ABANDONED RACEWAY OPENINGS IN BOXES, CABINETS, AND EQUIPMENT ENCLOSURES; SEALS SHALL RETAIN NEMA RATING OF REMAINING BOXES, CABINETS, AND EQUIPMENT ENCLOSURES.
- FOR EXISTING CIRCUITS WHERE ELECTRICAL ITEMS ARE REMOVED, CONTRACTOR SHALL PROVIDE ALL NECESSARY RACEWAYS, WIRES, BOXES, ETC., PER NEC REQUIREMENTS, TO ENSURE ELECTRICAL CONTINUITY AND PROPER OPERATION OF REMAINING CIRCUIT COMPONENTS.
- RETURN ALL SALVAGEABLE APPARATUS, AS DETERMINED BY THE DOW OR ITS REPRESENTATIVES, TO A SITE DESIGNATED BY DOW OR ITS REPRESENTATIVES, AT NO ADDITIONAL COST TO DOW. DISPOSE OF ALL UNWANTED MATERIALS OFFSITE.
- EXISTING CONDITIONS SHOWN ON THESE DRAWINGS ARE BASED ON THE BEST AVAILABLE AS-BUILT INFORMATION. CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS IN THE FIELD. NO ADDITIONAL COMPENSATION WILL BE PROVIDED FOR DIFFERENCES BETWEEN ACTUAL CONDITIONS AND THE CONDITIONS REPRESENTED ON THIS DRAWING.

POWER TRANSFER SWITCH. DESIGNATION, AMP RATING AND CONFIGURATION SHOWN

MTS = MANUAL TRANSFER SWITCH
 ATS = AUTOMATIC TRANSFER SWITCH
 SUSE = SUITABLE FOR USE AS SERVICE ENTRANCE

ATS # 60A, 3P

PRL PHASE REVERSAL/ LOSS RELAY

NEMA CONTACTOR

MINIMUM KAUA'I DEPARTMENT OF WATER (DOW) OPERATIONAL REQUIREMENTS DURING CONSTRUCTION:

- AT LEAST ONE WELL PUMP AND ASSOCIATED CHLORINATION PUMPS MUST BE OPERATIONAL AT ALL TIMES DURING CONSTRUCTION EXCEPT DURING SCHEDULED OUTAGES. MAXIMUM OUTAGE DURATION SHALL NOT EXCEED 8 HOURS AT NIGHT. DAYTIME OUTAGES SHALL BE STRICTLY LIMITED TO DURATIONS APPROVED BY DOW. TWO WELL PUMPS AND ASSOCIATED CHLORINATION PUMPS SHALL BE NORMALLY OPERATIONAL THROUGHOUT CONSTRUCTION, EXCEPT DURING PUMP REPLACEMENT WORK OR ELECTRICAL CUTOVERS.

GENERAL CONSTRUCTION NOTES:

- CONTRACTOR SHALL COORDINATE ALL WORK WITH KAUA'I ISLAND UTILITY COOPERATIVE (KIUC), AS REQUIRED.
- PROVIDE PULL CORD IN ALL EMPTY CONDUITS, UNLESS OTHERWISE NOTED.
- ALL PERMANENT EXPOSED PVC CONDUITS INSTALLED OUTDOORS SHALL BE PAINTED GRAY IN ACCORDANCE WITH THE CONDUIT MANUFACTURER'S INSTRUCTIONS FOR PROTECTION FROM SUN EXPOSURE.
- ALL ELECTRICAL EQUIPMENT ENCLOSURES AND EQUIPMENT MOUNTING HARDWARE AND FASTENERS FOR OUTDOOR INSTALLATION SHALL BE TYPE 316 STAINLESS STEEL, UNLESS OTHERWISE NOTED.

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

REVISION DATE SHEET BY APPROVED

DEPARTMENT OF WATER
 COUNTY OF KAUA'I

JOB NO. WKK-03

MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2
 KĪLAUEA, KAUA'I, HAWAII

ELECTRICAL SYMBOLS AND NOTES - 1

DESIGNED BY COT DRAWN BY SC CHECKED BY SH

APPROVED BY: *[Signature]* 3/11/19
 MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUA'I

BY: *[Signature]* 4/30/20 EXP DATE

SHEET 29 OF 60 SHEETS E-001

CONTROL DIAGRAM SYMBOLS

GENERAL		SELECTOR SWITCHES		CONTROL RELAYS		TIMING RELAYS		ABBREVIATIONS	
<p>----- EXTERNAL WIRING</p> <p>--- CONDUCTORS CONNECTED</p> <p>--- CONDUCTORS NOT CONNECTED</p> <p>XX TERMINAL POINT FOR EXTERNAL CONNECTIONS</p>	<p>1 2 ID LOCATION 2 POSITION MAINTAINED CONTACT X = CONTACTS CLOSED</p> <p>1 2 3 ID LOCATION 3 POSITION MAINTAINED CONTACT X = CONTACTS CLOSED</p>	<p>2 CR OPERATING COIL FUNCTION CR = CONTROL RELAY U = UNLATCH L = LATCH</p> <p>OL THERMAL OVERLOAD RELAY</p> <p>2CR 2CR (LINE) (LINE) OUTPUT CONTACTS. LINE NUMBER OF RELAY COIL SHOWN</p>	<p>3 TR OPERATING COIL ON or OFF DELAY RANGE:SEC/MIN SET:SEC/MIN</p> <p>NORMALLY OPEN NORMALLY CLOSED</p> <p>3TR 3TR LINE XX LINE XX</p> <p>ON DELAY (DELAY ON COIL ENERGIZATION) RELAY CONTACTS WITH NUMERIC PREFIX AND OPTIONAL REF. OR DESCRIPTION. NOTC = NORMALLY OPEN TIME CLOSE, NCTO = NORMALLY CLOSED TIME OPEN</p>	<p>A AMPERE AC ASPHALT CONCRETE AFF ABOVE FINISHED FLOOR AHJ AUTHORITY HAVING JURISDICTION AI ANALOG INPUT AIC AMPERES INTERRUPTING CAPACITY AO ANALOG OUTPUT BC BARE COPPER BP BOOSTER PUMP C CONDUIT CAT CATALOG CB CONTROL BUILDING CBP CHLORINATION BOOSTER PUMP CBR CIRCUIT BREAKER CCP CHLORINATION CONTROL PANEL CKT CIRCUIT CL CURRENT-LIMITING CONT CONTACTOR CT CURRENT TRANSFORMER CV CONTROL VALVE DB DUCTBANK DI DISCRETE INPUT DO DISCRETE OUTPUT DS DISCONNECT SWITCH DWG DRAWING EUSERC ELECTRIC UTILITY SERVICE EQUIPMENT REQUIREMENTS COMMITTEE FE FLOW ELEMENT FIT FLOW INDICATING TRANSMITTER FSL FLOW SWITCH LOW GEC GROUNDING ELECTRODE CONDUCTOR GFCI GROUND-FAULT CIRCUIT INTERRUPTER GND GROUND GRS GALVANIZED RIGID STEEL CONDUIT GS GENERATOR SHELTER GTB GENERATOR TERMINAL BOX HH HANDHOLE HOA HAND-OFF-AUTO HOAT HAND-OFF-AUTO-TIMER HP HORSEPOWER HTCO HAWAIIAN TELECOM HZ HERTZ I/O INPUT/OUTPUT JB JUNCTION BOX KCMIL 1000 CIRCULAR MILS DOW DEPARTMENT OF WATER, COUNTY OF KAUAI KIUC KAUAI ISLAND UTILITY COOPERATIVE KWH KILOWATT HOUR LS LIMIT SWITCH MAX MAXIMUM MCB MAIN CIRCUIT BREAKER MCC MOTOR CONTROL CENTER MCP MOTOR CIRCUIT PROTECTOR MIN MINIMUM MFPM MULTI-FUNCTION POWER MONITOR MANUFACTURER MFR MOTOR PROTECTION RELAY MS METER SOCKET MSH MOTOR SPACE HEATER MSP MAIN SERVICE PANELBOARD MTR MOTOR</p>					
<p>VA CONTROL TRANSFORMER. PRIMARY AND SECONDARY VOLTAGES SHOWN. SIZE AS SHOWN OR SPECIFIED. 480V 120V</p>		<p>INDICATING LIGHTS</p> <p>L = LENS COLOR: A = AMBER B = BLUE G = GREEN R = RED W = WHITE</p> <p>L DIRECT CONNECTION STATUS</p> <p>X1 PUSH TO TEST. TEST VOLTAGE TERMINAL SHOWN STATUS</p>		<p>INDICATING LIGHTS</p> <p>L = LENS COLOR: A = AMBER B = BLUE G = GREEN R = RED W = WHITE</p>		<p>OFF DELAY (DELAY ON COIL DE-ENERGIZATION) RELAY CONTACTS WITH NUMERIC PREFIX AND OPTIONAL REF. OR DESCRIPTION. NOTO = NORMALLY OPEN TIME OPEN. NCTC = NORMALLY CLOSED TIME CLOSE</p> <p>3TR 3TR LINE XX LINE XX</p> <p>TIME DELAY RELAY INSTANTANEOUS CONTACTS WITH NUMERIC PREFIX AND OPTIONAL REF. OR DESCRIPTION.</p>		<p>PH PHASE PIT PRESSURE INDICATING TRANSMITTER PNL PANEL PRL PHASE REVERSAL/LOSS RELAY PSH PRESSURE SWITCH HIGH PSL PRESSURE SWITCH LOW PVC POLYVINYL CHLORIDE RC REINFORCED CONCRETE DUCTBANK REC RECEPACLE RTM RUN-TIME METER RTU REMOTE TERMINAL UNIT RVSS REDUCED-VOLTAGE SOLID-STATE SOFT STARTER SCADA SUPERVISORY CONTROL AND DATA ACQUISITION SEC SECURITY SP SPECIAL PROVISIONS SPD SURGE PROTECTIVE DEVICE SS SOLID-STATE SST STAINLESS STEEL (TYPE 316 UON) STB SHORTING TERMINAL BLOCK SUSE SUITABLE FOR USE AS SERVICE ENTRANCE SV SOLENOID VALVE SVC SERVICE SYM SYMMETRICAL TB TERMINAL BLOCK TEL TELEPHONE TEMP TEMPORARY TSH TEMPERATURE SWITCH HIGH TSP TWISTED SHIELDED PAIR TYP TYPICAL UON UNLESS OTHERWISE NOTED V VOLT W WIRE WP WELL PUMP WPR WEATHERPROOF XFMR TRANSFORMER ZS POSITION SWITCH</p>	
<p>TRANSFORMERS</p>		<p>INPUT SWITCHES</p> <p>NORMALLY OPEN NORMALLY CLOSED INITIATING VARIABLE</p> <p>FS-101 FS-102 FLOW LOCATION LOCATION</p> <p>ZS-101 ZS-102 POSITION (LIMIT) LOCATION LOCATION</p>		<p>CONTACTORS</p> <p>ID OPERATING COILS C = CONTACTOR, LIGHTING OR GENERAL USE F = FAST OR FORWARD M = MAIN OR LINE 1M = FIRST MAIN OR WYE 2M = SECOND MAIN OR DELTA R = RUN OR REVERSE S = SLOW OR START</p> <p>ID MAIN CONTACTS SIZE</p>		<p>MISCELLANEOUS</p> <p>KVAR CAPACITOR</p> <p>LOCATION REMOTE DEVICE LOCATED AT FIELD EQUIPMENT</p> <p>GROUND CONNECTION</p> <p>ETHERNET RJ-45 CONNECTION</p> <p>SHIELDED WIRING</p>		<p>NEC NATIONAL ELECTRICAL CODE NEMA NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION NTS NOT TO SCALE OC ON CENTER OSHA OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION PAVT PAVEMENT PC PHOTOCELL PCV PUMP CONTROL VALVE PFCC POWER FACTOR CORRECTION CAPACITOR PH PHASE PIT PRESSURE INDICATING TRANSMITTER PNL PANEL PRL PHASE REVERSAL/LOSS RELAY PSH PRESSURE SWITCH HIGH PSL PRESSURE SWITCH LOW PVC POLYVINYL CHLORIDE RC REINFORCED CONCRETE DUCTBANK REC RECEPACLE RTM RUN-TIME METER RTU REMOTE TERMINAL UNIT RVSS REDUCED-VOLTAGE SOLID-STATE SOFT STARTER SCADA SUPERVISORY CONTROL AND DATA ACQUISITION SEC SECURITY SP SPECIAL PROVISIONS SPD SURGE PROTECTIVE DEVICE SS SOLID-STATE SST STAINLESS STEEL (TYPE 316 UON) STB SHORTING TERMINAL BLOCK SUSE SUITABLE FOR USE AS SERVICE ENTRANCE SV SOLENOID VALVE SVC SERVICE SYM SYMMETRICAL TB TERMINAL BLOCK TEL TELEPHONE TEMP TEMPORARY TSH TEMPERATURE SWITCH HIGH TSP TWISTED SHIELDED PAIR TYP TYPICAL UON UNLESS OTHERWISE NOTED V VOLT W WIRE WP WELL PUMP WPR WEATHERPROOF XFMR TRANSFORMER ZS POSITION SWITCH</p>	
<p>OVERCURRENT DEVICES</p> <p>ID AMPS CIRCUIT BREAKER, THERMAL-MAGNETIC, 3 POLE. MODIFIERS: /M MOTOR CIRCUIT PROTECTOR (MAGNETIC ONLY) /2 POLES, IF OTHER THAN 3</p> <p>ID AMPS FUSE, 3 POLE MODIFIERS: CLF = CURRENT LIMITING FUSE DE = DUAL ELEMENT F = CLASS F</p>		<p>PUSHBUTTONS</p> <p>ID LOCATION PUSHBUTTON, MOMENTARY CONTACT, NORMALLY OPEN</p> <p>ID LOCATION PUSHBUTTON, MOMENTARY CONTACT, NORMALLY CLOSED</p> <p>ID LOCATION PUSHBUTTON WITH MUSHROOM HEAD, EMERGENCY STOP, MAINTAINED CONTACT</p>		<p>OUTPUT LOADS AND DEVICES</p> <p>MTR MOTOR</p> <p>250 W SPACE HEATER. WATTAGE SHOWN</p> <p>SOLENOID</p>		<p>ABBREVIATIONS</p>			

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

REVISION DATE BY APPROVED

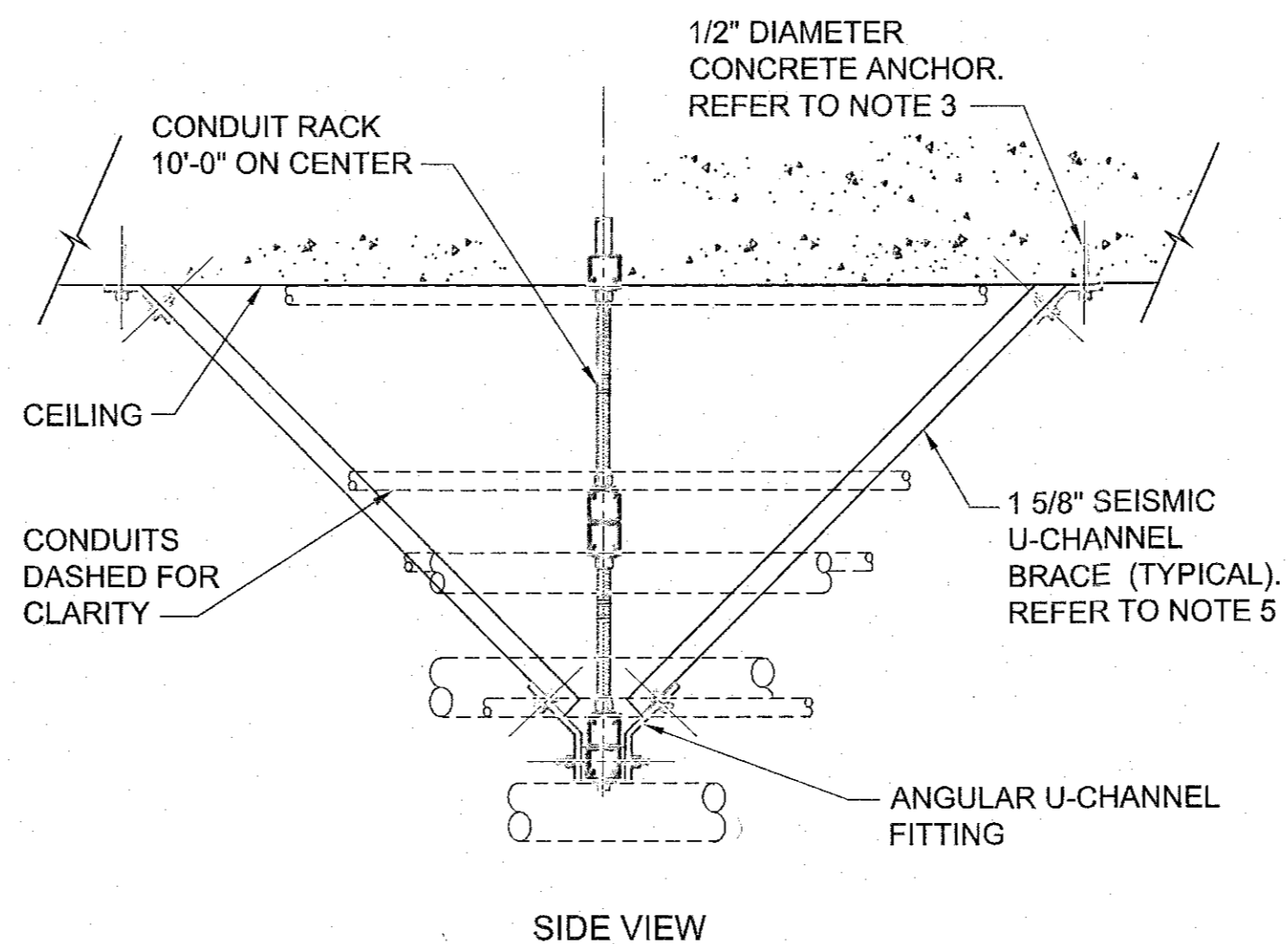
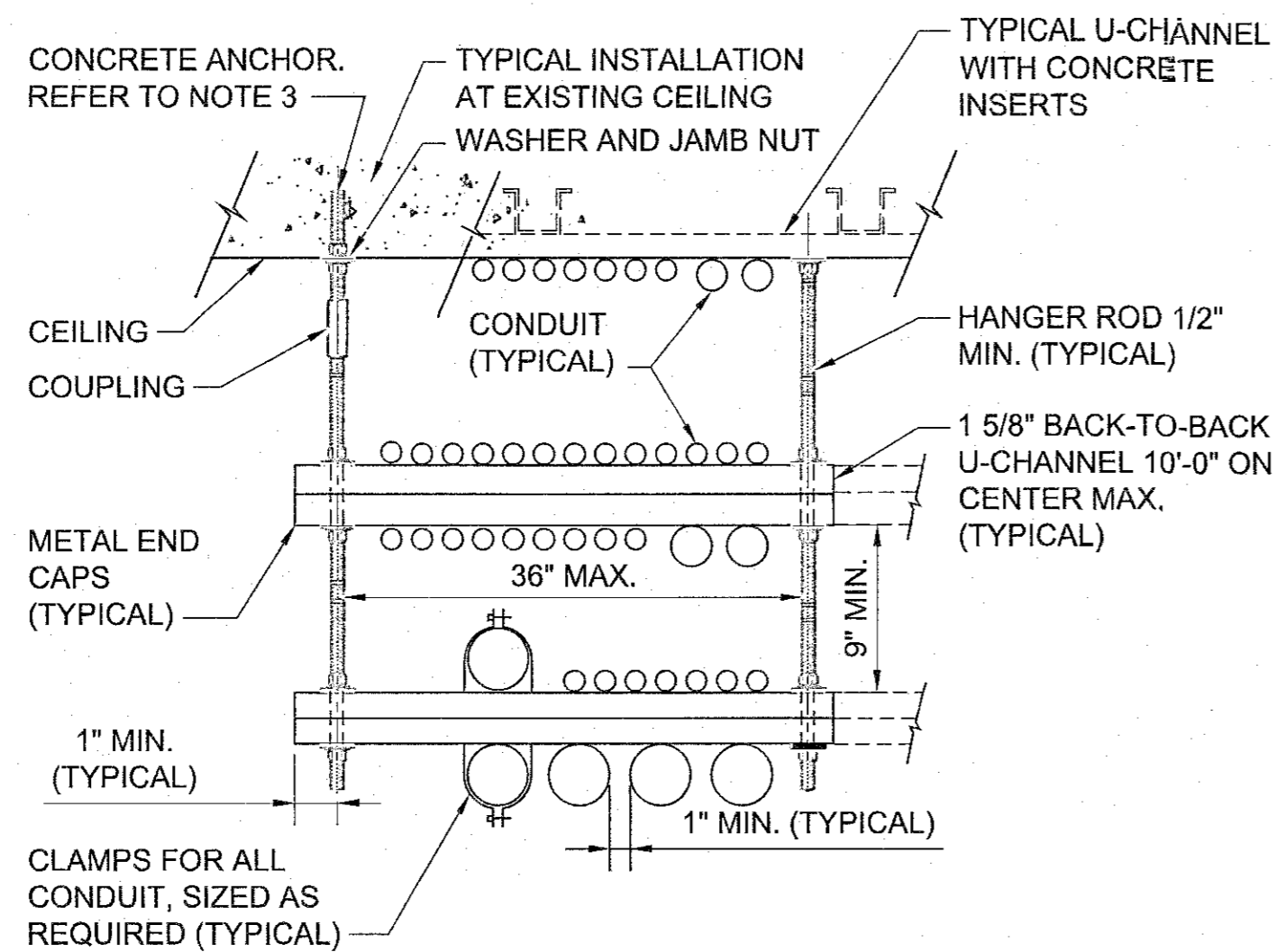
DEPARTMENT OF WATER
COUNTY OF KAUAI
JOB NO. WKK-03
MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2
KILAUEA, KAUAI, HAWAII

ELECTRICAL SYMBOLS AND NOTES - 2
DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH
APPROVED BY: *[Signature]* 3/11/19
MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI

BY: *[Signature]* 4/30/20 EXP DATE

SHEET 30 OF 60 SHEETS E-002

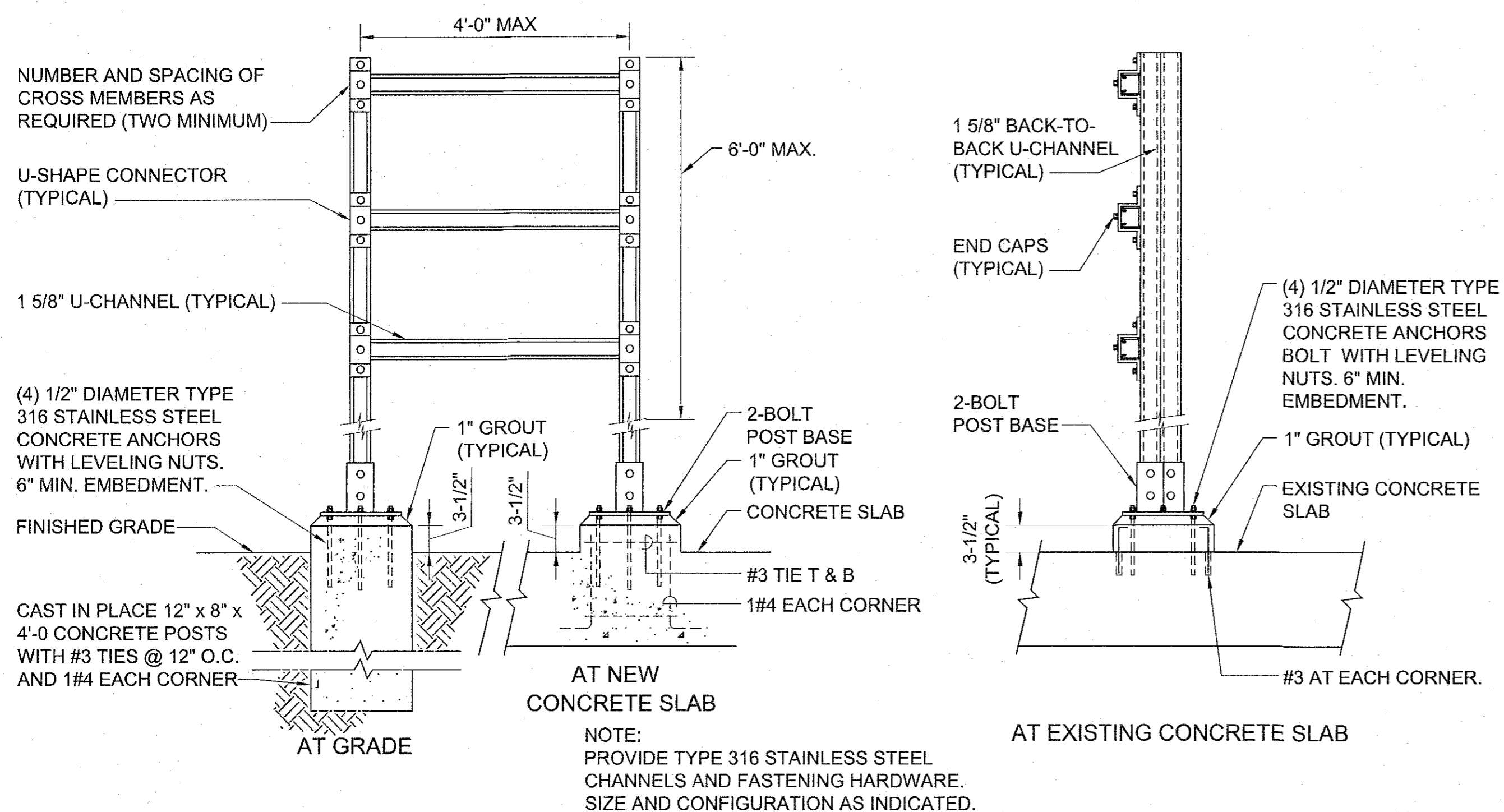
- NOTES:
1. MATERIALS AND HARDWARE PER SPECIFICATION SECTION SP-8.
 2. HOLE SIZES ON FITTINGS SHALL BE 9/16" DIAMETER WITH 1/2" HEX HEAD CAP SCREW 15/16" LONG AND 1/2" CLAMP NUT WITH SPRING.
 3. SEE TYPICAL CONCRETE ANCHOR OR THREADED ROD DETAIL FOR ANCHOR REQUIREMENTS.
 4. MAX. UNIFORMLY DISTRIBUTED LOAD (CONDUIT AND FILL) PER UNIT TO BE 1000 LBS.
 5. SEISMIC CHANNEL BRACING REQUIRED AT INTERVALS OF 60'-0" MAX. FOR SEISMIC ZONE 3 AND 40'-0" MAX. FOR SEISMIC ZONE 4.
 6. PROVIDE NECESSARY NUMBER OF HORIZONTAL TRAPEZE STRUTS AS REQUIRED TO SUPPORT CONDUITS INSTALLED.



**RACEWAY SUPPORTS
SUSPENDED DETAIL**

SCALE: NTS

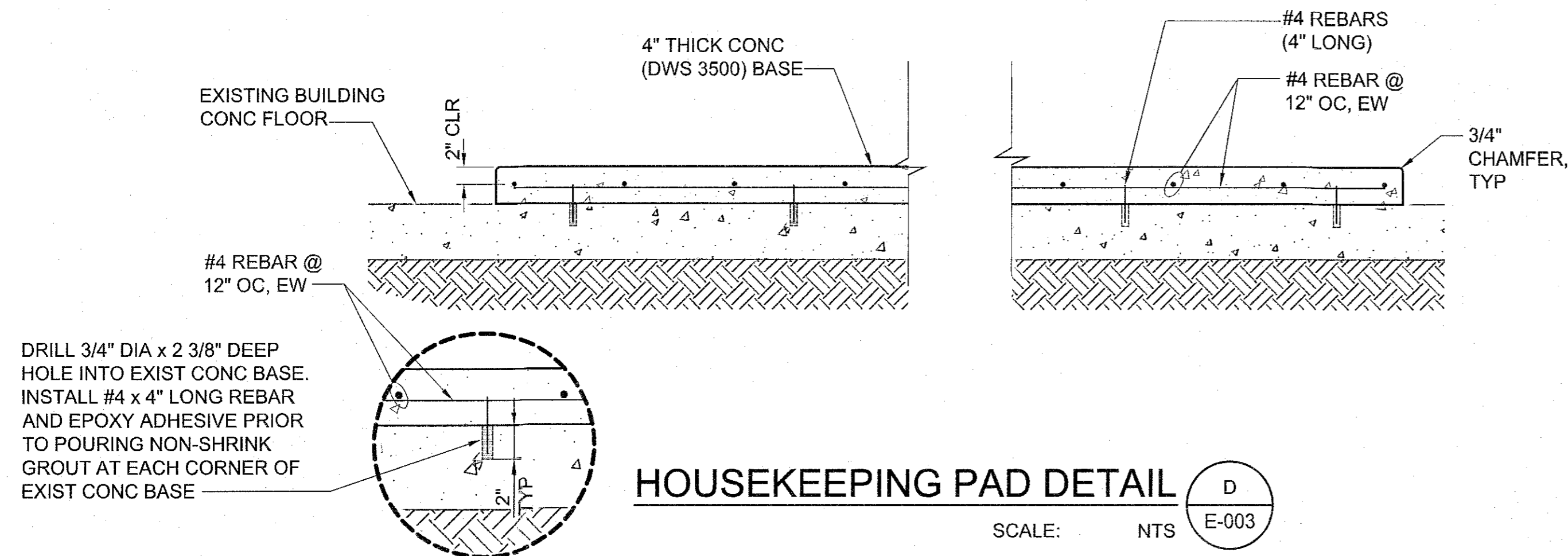
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E-003



EQUIPMENT SUPPORT STRUT RACK DETAIL

SCALE: NTS

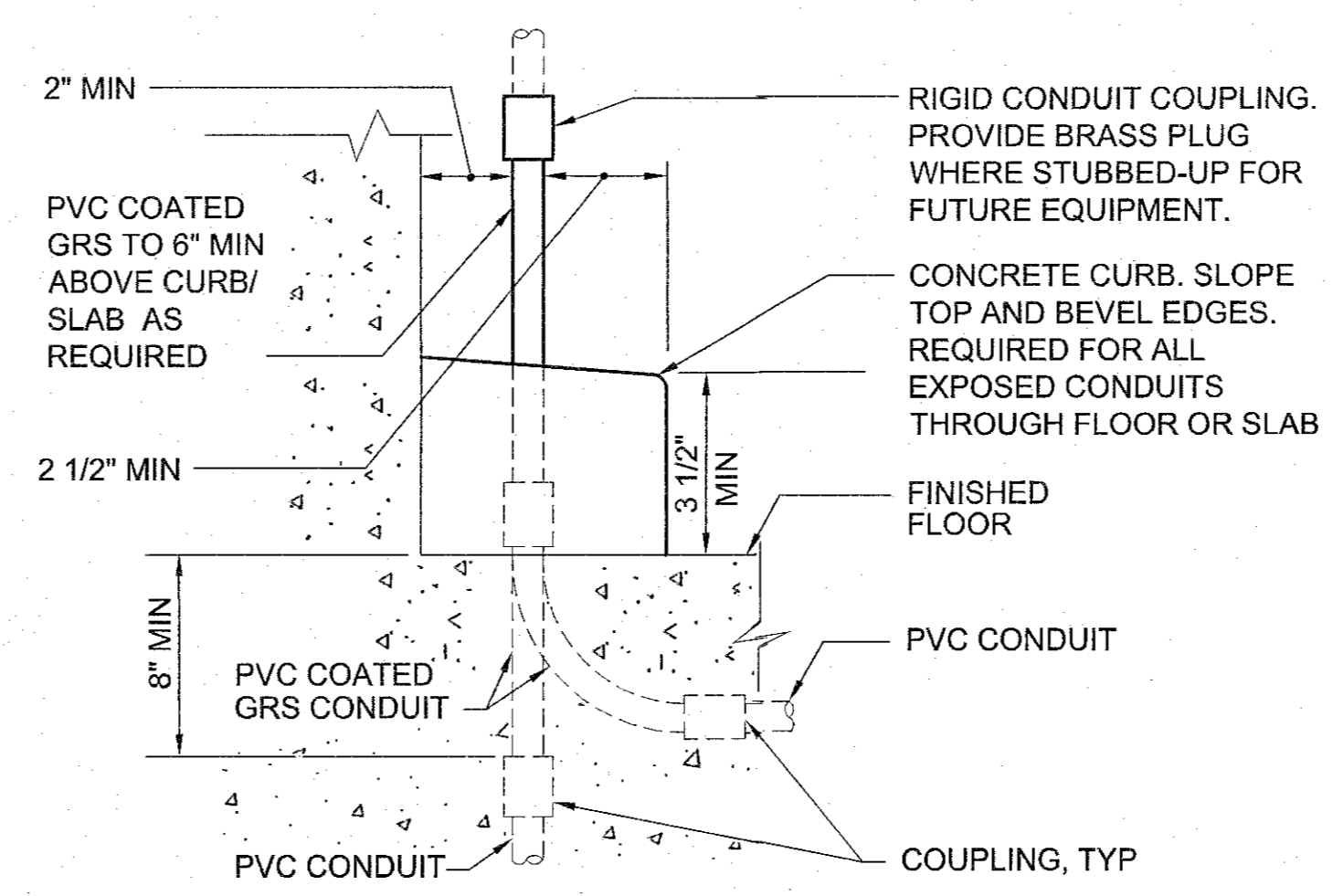
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E-003



HOUSEKEEPING PAD DETAIL

SCALE: NTS

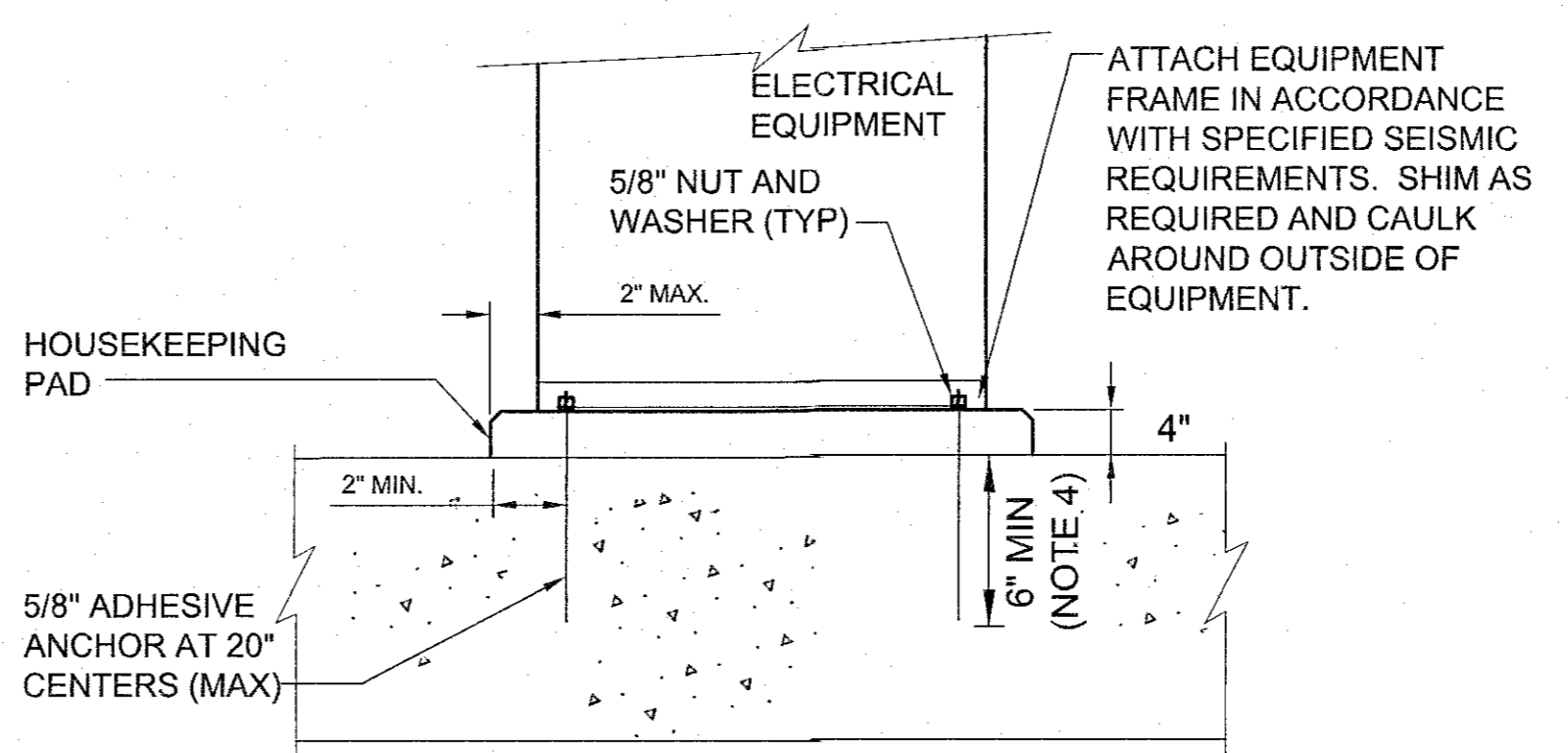
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E-003



**CONDUIT CURB STUB-UP
DETAIL**

SCALE: NTS

C
E-003



**FLOOR-MOUNTED EQUIPMENT
ANCHORAGE DETAIL**

SCALE: NTS

E
E-003

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2\"/>

REVISION	DATE	BRIEF	BY	APPROVED

DEPARTMENT OF WATER
COUNTY OF KAUAI
JOB NO. WKK-03
**MCC, CHLORINATION FACILITIES -
KĪLAUEA WELLS NO. 1 AND NO. 2
KĪLAUEA, KAUAI, HAWAII**

ELECTRICAL AND INSTRUMENTATION
DETAILS - 1

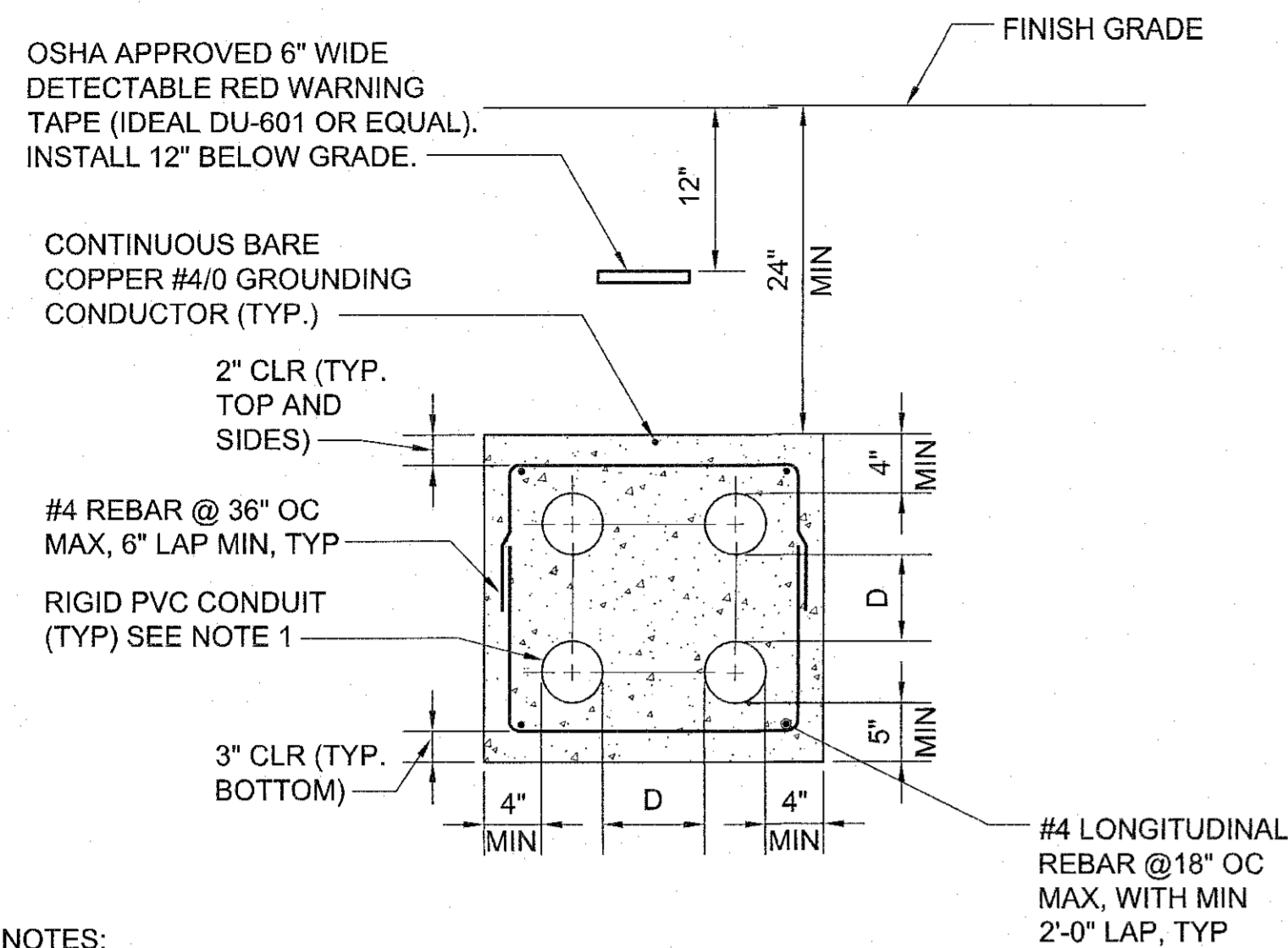
DESIGNED BY: COT DRAWN BY: CS CHECKED BY: SH

APPROVED BY: *[Signature]* 3/11/19
MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI DATE

BY: *[Signature]* 4/30/20 EXP. DATE

SHEET 31 OF 60 SHEETS E-003

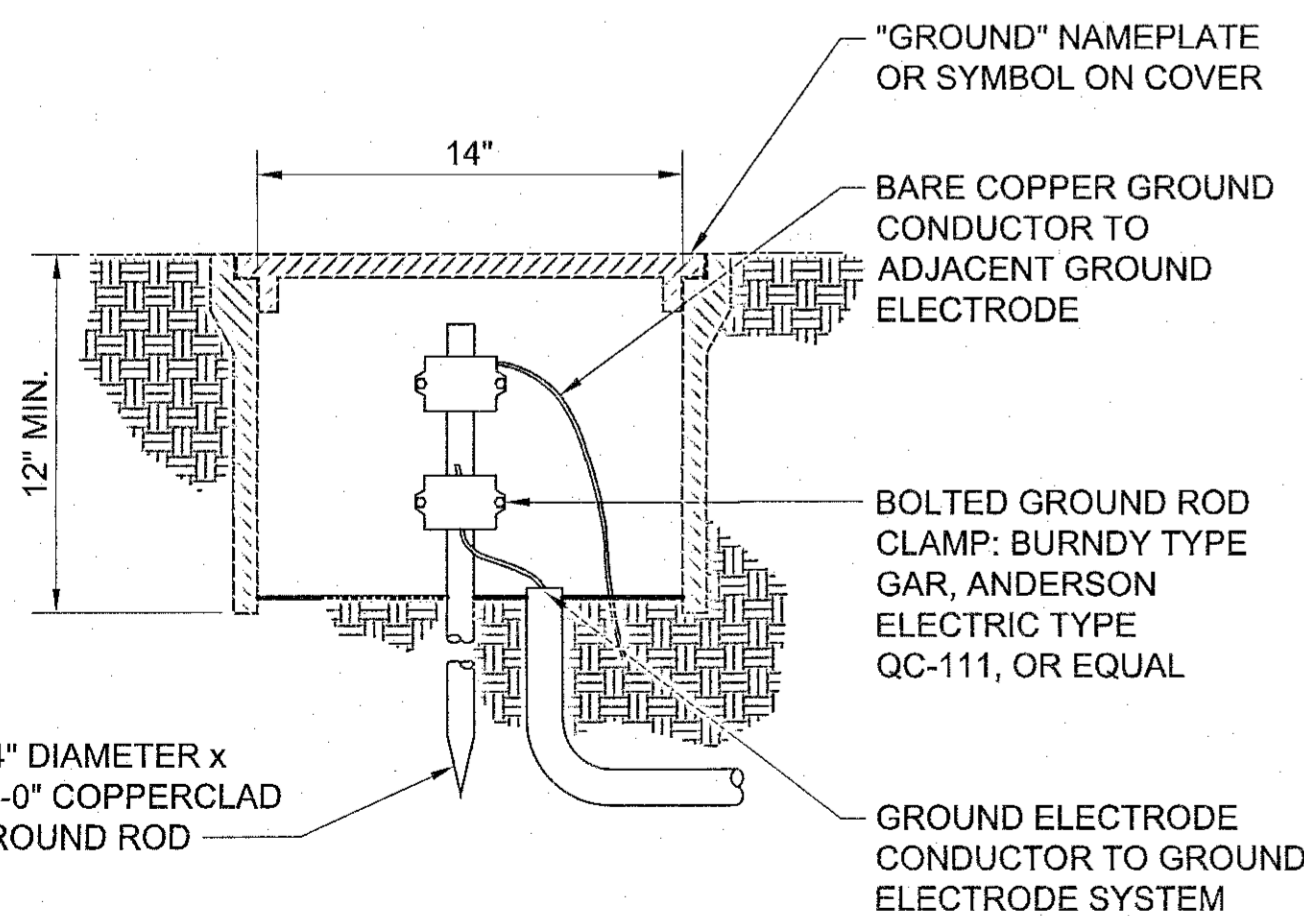
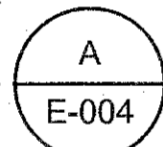
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- NOTES:**
1. QUANTITY AND SIZE OF ELECTRICAL DUCTS AS INDICATED ON DRAWINGS.
 2. PROVIDE 6" MINIMUM COMPACTED GRAVEL, 3/4" MINUS, UNDER ALL CONCRETE ENCASED DUCT RUNS.
 3. PROVIDE MINIMUM COVER OVER DUCTBANKS OF 24" TO GRADE.
 4. D = 2" FOR CONDUITS LESS THAN 4". D = 3" FOR CONDUITS 4" AND LARGER.
 5. SADDLE-TYPE CONDUIT SPACERS REQUIRED EVERY 8" (CARLON SNAP-LOC, SNAP-N-STAC, OR EQUAL).
 6. BOND GROUNDING CONDUCTOR TO ALL GROUNDING ELECTRODES ALONG ITS PATH, INCLUDING BUILDING GROUNDING ELECTRODE AT EACH END OF THE DUCTBANK.
 7. REFER TO DETAIL B/E-004 FOR TRENCH RESTORATION REQUIREMENTS ABOVE DUCTBANK.
 8. CONTRACTOR SHALL ROUTE ELECTRICAL DUCTBANKS BELOW WATERLINES WHEREVER CROSSINGS OCCUR AND MAINTAIN CLEARANCE OF 12" BETWEEN DUCTBANKS AND WATERLINES. THE CONTRACTOR SHALL ACCOUNT FOR THIS ADDITIONAL DEPTH IN DUCTBANK TRENCHING REQUIREMENTS.

CONCRETE-ENCASED DUCTBANK DETAIL

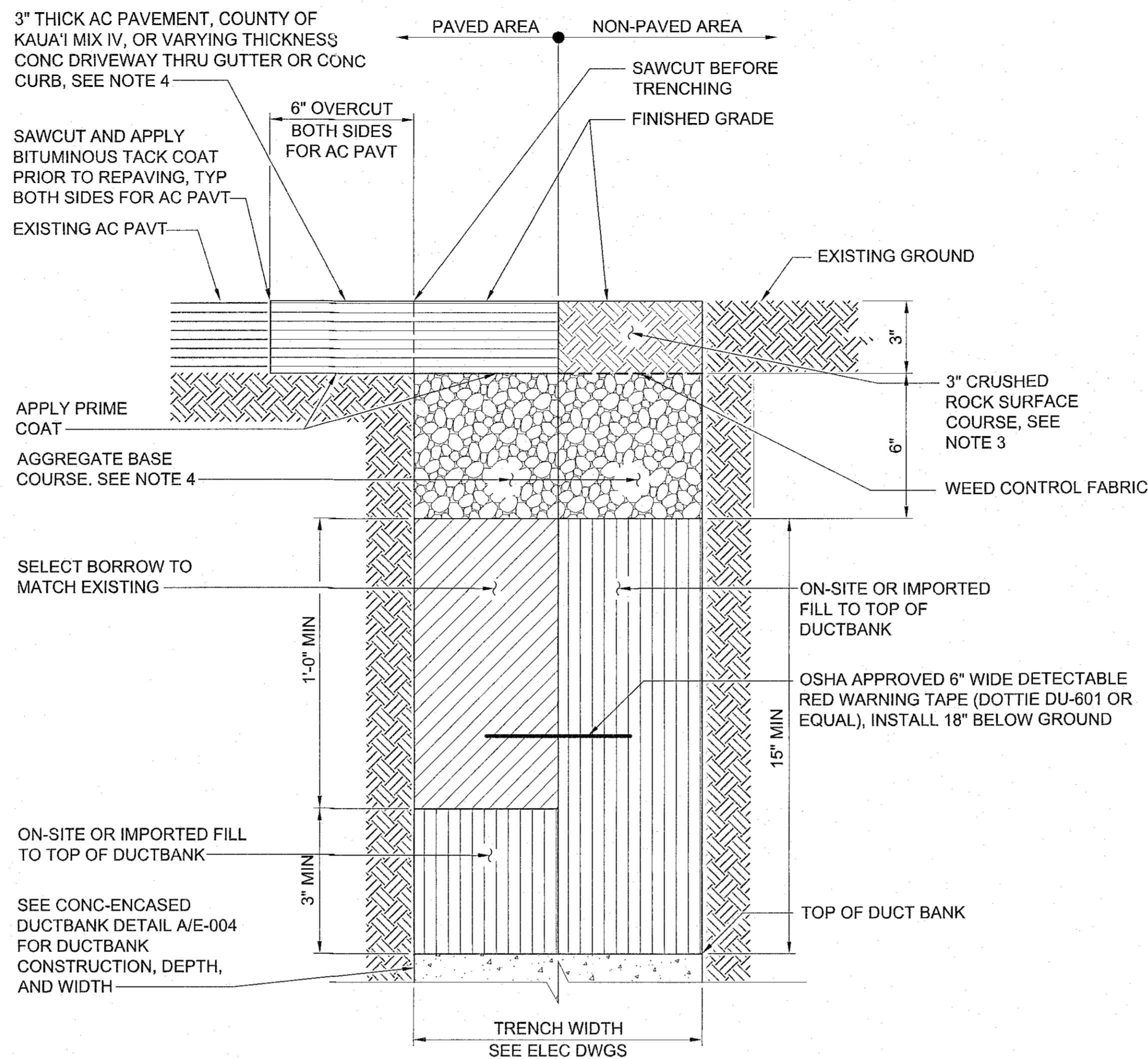
SCALE: NTS



- NOTES:**
1. TEST WELL OF CONCRETE, PVC, OR FRP MATERIAL.

GROUND ROD WITH TEST WELL DETAIL

SCALE: NTS

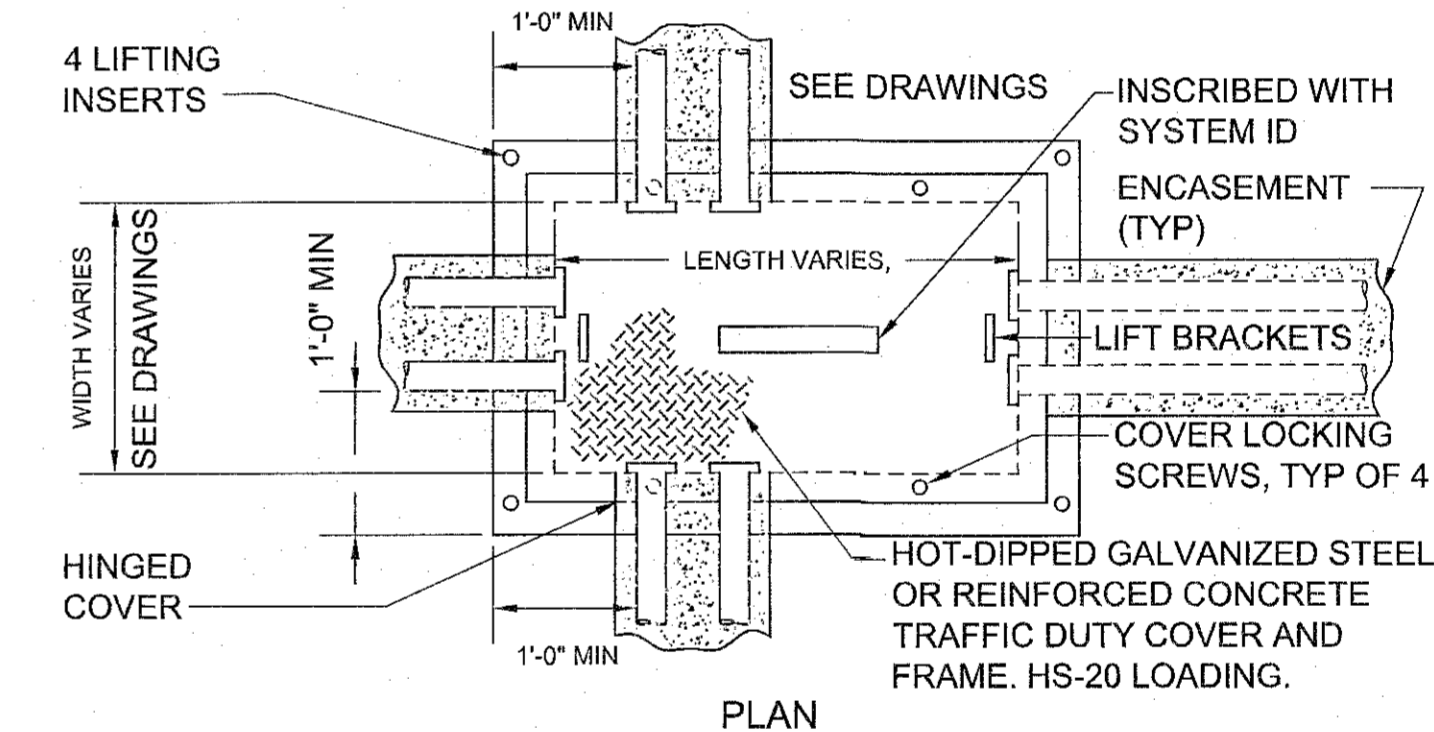
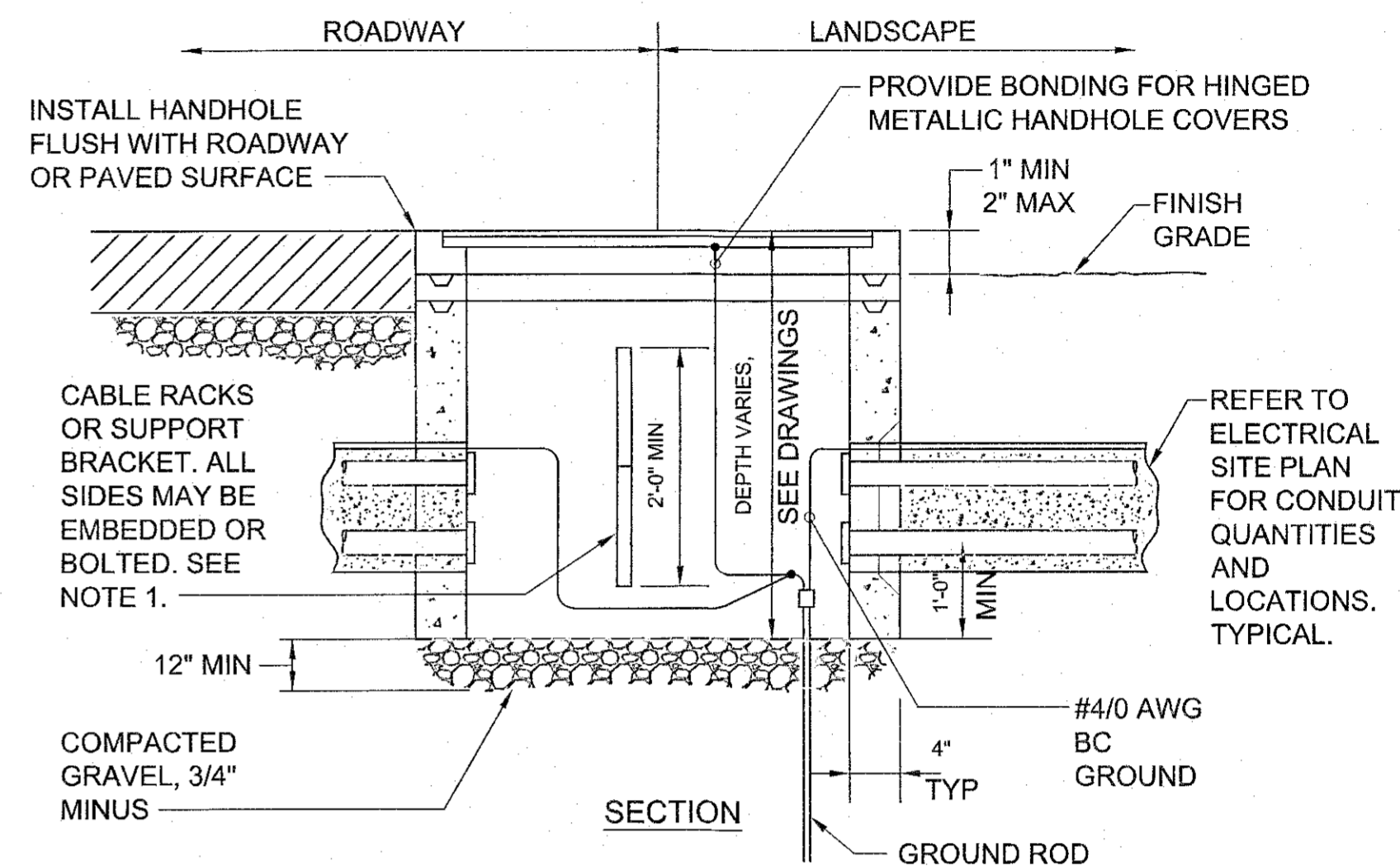
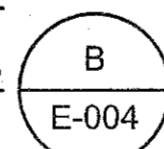


NOTES:

1. ALL FINISHED GRADES SHALL MATCH SURROUNDING AND ADJACENT EXISTING GRADES. THE CONTRACTOR SHALL PROVIDE SMOOTH TRANSITION TO MATCH EXISTING GRADES.
2. TRENCH EXCAVATION EXTENTS SHALL BE SAWCUT AT SPECIFIED TRENCH WIDTH INTO EXISTING AC PAVEMENT, CONCRETE DRIVEWAY CURB AND GUTTER, AND CONCRETE CURB AND GUTTER PRIOR TO EXCAVATION AND REMOVAL.
3. FOR NON-PAVED AREA THAT DOES NOT HAVE CRUSHED ROCK SURFACE COURSE SHALL BE 6" TOP SOIL ON ON-SITE OR IMPORTED FILL.
4. WHERE EXISTING LAYER THICKNESS IS GREATER THAN SHOWN ON THIS DETAIL, MATCH EXISTING THICKNESS. TYPICAL FOR AC PAVEMENT, PORTLAND CONCRETE PAVEMENT, OR AGGREGATE BASE COURSE.

CONCRETE ENCASED ELECTRICAL DUCT BANK TRENCH DETAIL

SCALE: NTS

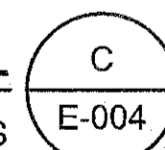


NOTES:

1. PROVIDE HEAVY DUTY ADJUSTABLE NONMETALLIC CABLE RACKS, MINIMUM TWO RACKS PER LONG WALL (FOUR TOTAL) WITH THREE CABLE HOOKS/ARMS PER RACK.

TYPICAL HANDHOLE DETAIL

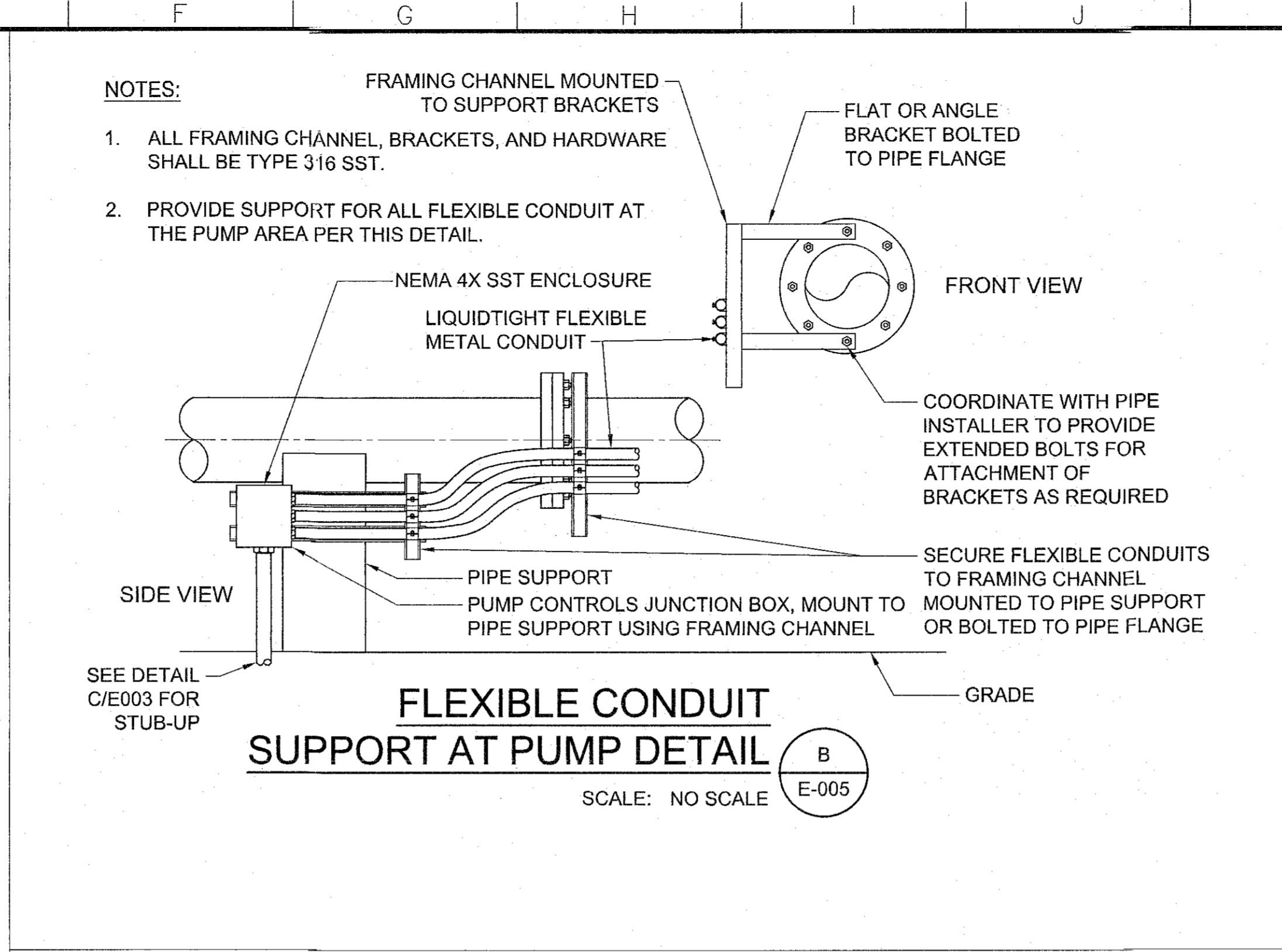
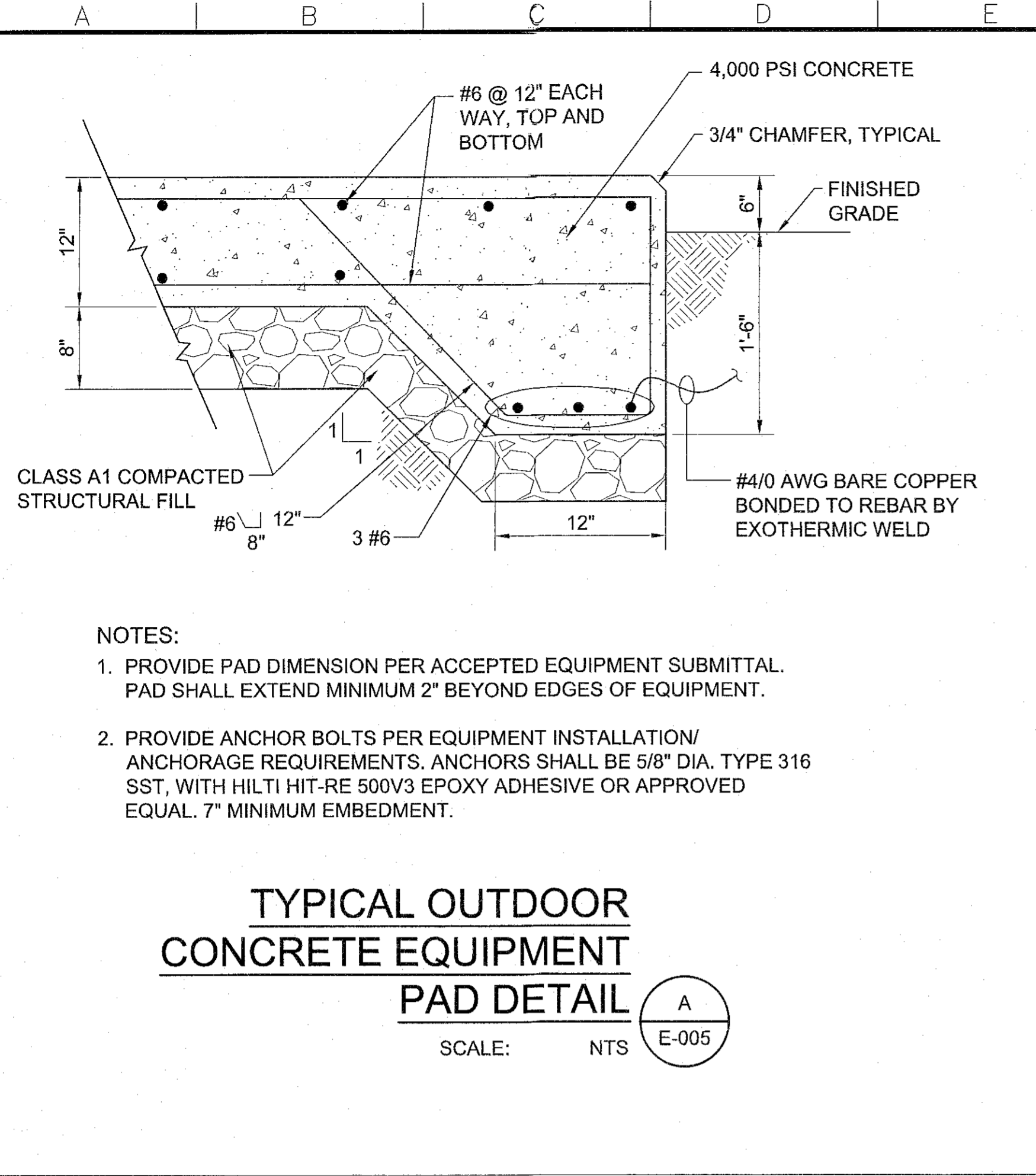
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	REVISION	DATE	BY	APPROVED						
	<p>DEPARTMENT OF WATER COUNTY OF KAUAI</p> <p>JOB NO. WKK-03</p> <p>MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2 KĪLAUEA, KAUAI, HAWAII</p>									
<p>ELECTRICAL AND INSTRUMENTATION DETAILS - 2</p> <p>DESIGNED BY: COT DRAWN BY: CS CHECKED BY: SH</p> <p>APPROVED BY: <i>William C. ...</i> 3/11/19 DATE</p> <p>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</p>										
<p>SHEET 32 OF 60 SHEETS E-004</p>										

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	DEPARTMENT OF WATER COUNTY OF KAUAI				
	JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII				
	ELECTRICAL AND INSTRUMENTATION DETAILS - 3 DESIGNED BY: COT DRAWN BY: CS CHECKED BY: SH APPROVED BY: <i>[Signature]</i> 3/11/19 <small>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</small>				
SHEET 33 OF 60 SHEETS E-005					


GENERAL ELECTRICAL SEQUENCING NOTES:

1. THE WORK SEQUENCE PROVIDED IN THESE CONTRACT DOCUMENTS DESCRIBES MAJOR WORK ACTIVITIES AND ASSOCIATED CONSTRAINTS THAT THE CONTRACTOR SHALL INCLUDE IN PLANNING AND SCHEDULING THE CONTRACT WORK. THE CONTRACTOR SHALL DEVELOP A DETAILED WORK SEQUENCING PLAN THAT MAINTAINS DOW'S MINIMUM OPERATIONAL REQUIREMENTS THROUGHOUT CONSTRUCTION AND SHALL SUBMIT THE WORK SEQUENCING PLAN TO DOW FOR REVIEW AND APPROVAL. REFER TO DOW'S MINIMUM OPERATIONAL REQUIREMENTS LISTED ON DWG E-001. THE CONTRACTOR'S WORK SEQUENCE SHALL INCLUDE A DETAILED SCHEDULE WITH PROPOSED WORK ACTIVITIES, DATES, AND DURATIONS FOR PLANNED OUTAGES. DOW SHALL BE NOTIFIED AT LEAST 14 DAYS IN ADVANCE OF ANY PLANNED OUTAGES. OUTAGES SHALL BE PERFORMED ONLY DURING DOW-APPROVED DAYS AND TIMES AND MAY REQUIRE NIGHTTIME, WEEKEND, AND/OR HOLIDAY WORK. THE CONTRACTOR SHALL ENSURE THAT THE WORK OF ALL TRADES IS COORDINATED APPROPRIATELY. ANY PROPOSED DEVIATIONS FROM THE WORK SEQUENCING REQUIREMENTS IN THESE CONTRACT DOCUMENTS SHALL BE APPROVED BY DOW.

ELECTRICAL WORK SEQUENCE:

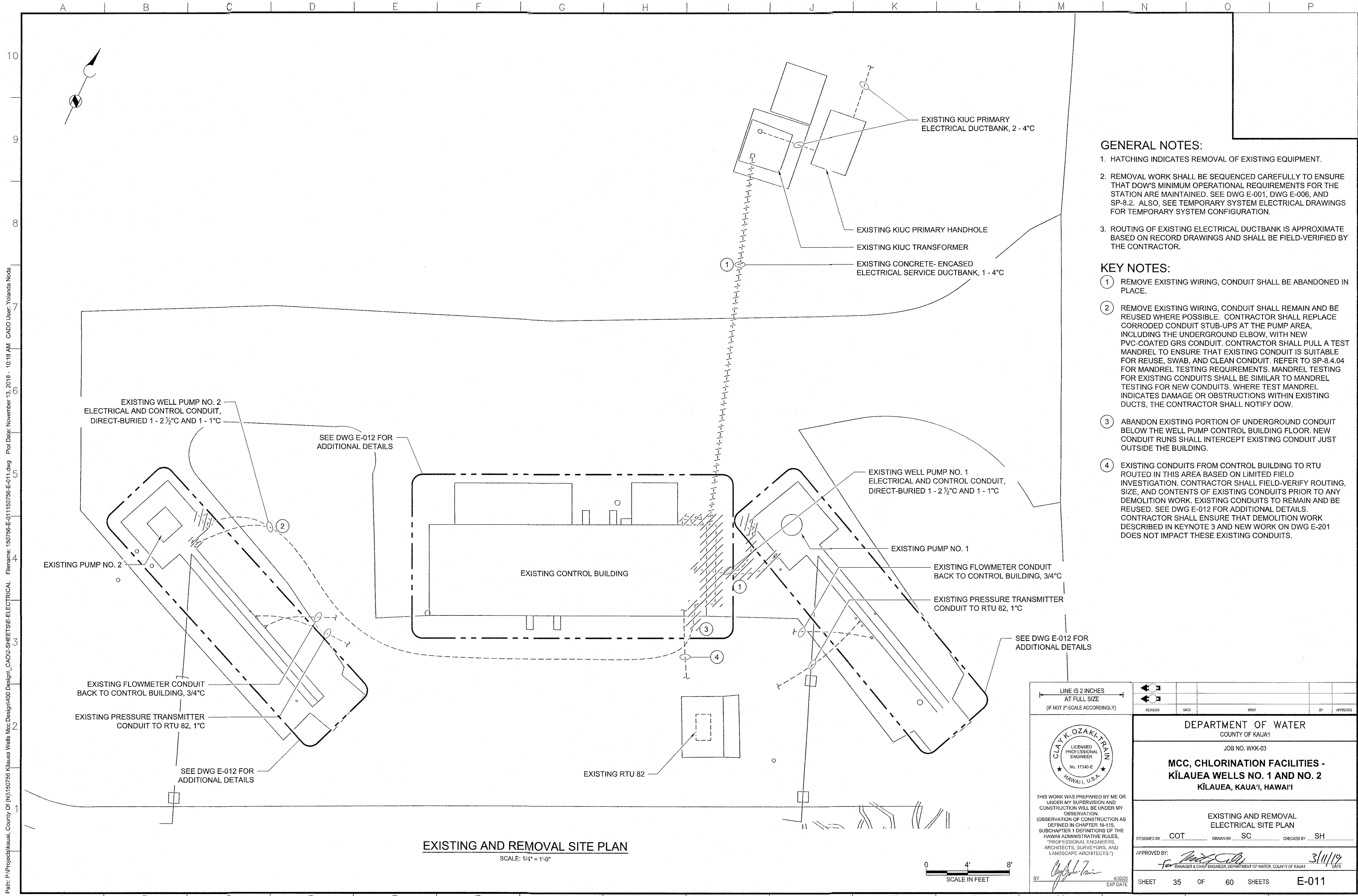
1. PERFORM SITE AND UNDERGROUND WORK, INCLUDING CONDUIT AND DUCTBANK INSTALLATION, IN THE VICINITY OF THE NEW GENERATOR SHELTER IN PREPARATION FOR THE CONSTRUCTION OF THE NEW GENERATOR SHELTER.
2. CONSTRUCT THE GENERATOR SHELTER. INSTALL ELECTRICAL SERVICE EQUIPMENT, INCLUDING MAIN SERVICE PANELBOARD, METER SOCKET, AND CT CABINET, AT THE GENERATOR SHELTER IN PREPARATION FOR THE NEW ELECTRICAL SERVICE FROM KIUC. INSTALL GENERATOR TERMINAL BOX, PANELBOARD, LIGHTING, AND OTHER MISCELLANEOUS ELECTRICAL EQUIPMENT AT THE GENERATOR SHELTER.
3. INSTALL TEMPORARY ELECTRICAL EQUIPMENT AT THE EXISTING CONTROL BUILDING, INCLUDING TEMPORARY MCC AND PANELBOARD PNL-A. INSTALL TEMPORARY CONDUIT TO FEED EXISTING LOADS.
4. SCHEDULE AN OUTAGE WITH DOW TO DEENERGIZE THE ELECTRICAL SERVICE TO THE CONTROL BUILDING. IF REQUIRED, COORDINATE OUTAGE WITH KIUC. CONTRACTOR SHALL PLAN FOR OUTAGE WORK TO BE PERFORMED AT NIGHT. INSTALL TEMPORARY FEEDER FROM EXISTING MAIN SERVICE PANELBOARD TO TEMPORARY MCC WHILE SERVICE IS DEENERGIZED. RESTORE ELECTRICAL SERVICE. ENERGIZE AND TEST THE TEMPORARY MCC. MAINTAIN OPERATION OF THE WELL PUMPS FROM THE EXISTING MCC WITHIN THE CONTROL BUILDING.
5. TRANSFER LOADS FROM THE EXISTING MCC TO THE TEMPORARY MCC ONE AT A TIME. COORDINATE WELL PUMP OUTAGES WITH DOW. TRANSFER OF CHLORINATION PUMPS/SYSTEM SHALL BE COORDINATED WITH TRANSFER OF WELL PUMPS TO ENSURE CONTINUED OPERATION OF THE CHLORINATION SYSTEM. TIE IN PUMP CONTROL I/O FROM THE TEMPORARY MCC TO THE EXISTING RTU 82. TRANSFER BUILDING 120V LOADS FROM THE EXISTING PANELBOARD TO PNL-A. MAINTAIN DOW'S MINIMUM OPERATIONAL REQUIREMENTS DURING THIS TIME. PROVE OPERATION OF THE STATION FROM THE TEMPORARY ELECTRICAL EQUIPMENT TO THE SATISFACTION OF DOW.
6. SCHEDULE A BRIEF OUTAGE WITH DOW TO DISCONNECT THE FEEDER FROM THE EXISTING MAIN SERVICE PANELBOARD TO THE EXISTING MCC. IF REQUIRED, COORDINATE OUTAGE WITH KIUC. RESTORE ELECTRICAL SERVICE TO THE TEMPORARY EQUIPMENT IMMEDIATELY AFTER. DEMOLISH EXISTING ELECTRICAL EQUIPMENT NO LONGER REQUIRED WITHIN THE CONTROL BUILDING. DEMOLISH THE EXISTING SURGE ARRESTOR CABINET OUTSIDE THE BUILDING AT THE SAME TIME AS THE EXISTING MCC.
7. DEMOLISH AND REPLACE THE CONTROL BUILDING ROOF. REMOVE AND REPLACE CONDUIT AND WIRING CURRENTLY MOUNTED TO THE CEILING WHERE CIRCUITS MUST REMAIN IN USE. PROVIDE TEMPORARY WEATHER PROTECTION FOR EXISTING EQUIPMENT IN THE CONTROL BUILDING DURING THE ROOF REPLACEMENT.
8. COMPLETE INSTALLATION OF UNDERGROUND DUCTBANK BETWEEN THE GENERATOR SHELTER AND THE CONTROL BUILDING, AND INSTALL NEW UNDERGROUND DUCTBANKS TO WELL PUMPS IN THE IMMEDIATE VICINITY OF THE CONTROL BUILDING. TUNNEL BELOW CONTROL BUILDING FOOTING AND SAWCUT AND/OR CORE DRILL THE FLOOR SLAB TO INSTALL ALL CONDUITS BELOW SLAB AS WELL AS STUB-UPS BELOW THE PERMANENT MCC LOCATION. RESTORE FLOOR SLAB AND REINFORCEMENT TO EXISTING CONDITION OR BETTER.
9. INSTALL NEW MCC AND MISCELLANEOUS ELECTRICAL AND CONTROL EQUIPMENT IN THE CONTROL BUILDING.
10. COMPLETE INSTALLATION OF THE UNDERGROUND DUCTBANK FROM THE GENERATOR SHELTER TO THE KIUC TRANSFORMER FOR THE NEW ELECTRICAL SERVICE. SCHEDULE AN OUTAGE WITH KIUC AND DOW TO DEENERGIZE THE ELECTRICAL SERVICE TO ALLOW WORK AT THE TRANSFORMER. INSTALL NEW SERVICE DUCTBANK TO THE SECONDARY OF THE KIUC TRANSFORMER, INCLUDING ANY REQUIRED MODIFICATIONS/RESTORATION FOR THE TRANSFORMER PAD OR SUBGRADE BOX. INSTALL NEW SERVICE CONDUCTORS FROM THE KIUC TRANSFORMER TO THE NEW ELECTRICAL SERVICE EQUIPMENT AT THE GENERATOR SHELTER. ENERGIZE THE NEW ELECTRICAL SERVICE TO THE GENERATOR SHELTER AND RESTORE THE EXISTING ELECTRICAL SERVICE TO THE CONTROL BUILDING. COORDINATE ALL WORK WITH KIUC AS REQUIRED. CONTRACTOR SHALL PLAN FOR WORK TO BE PERFORMED AT NIGHT. IF REQUIRED BY DOW BASED ON THE PLANNED DURATION OF THE OUTAGE, RESTORE ELECTRICAL SERVICE AND RETURN PUMP STATION TO OPERATION FROM THE TEMPORARY ELECTRICAL SYSTEM AFTER LANDING CONDUITS AT THE TRANSFORMER BUT PRIOR TO INSTALLING THE NEW ELECTRICAL SERVICE CONDUCTORS. SCHEDULE AND PERFORM A SEPARATE OUTAGE TO INSTALL NEW SERVICE CONDUCTORS. THE EXISTING ELECTRICAL SERVICE SHOULD REMAIN IN USE AND THE PUMP STATION SHOULD REMAIN IN OPERATION FROM THE TEMPORARY ELECTRICAL EQUIPMENT AFTER KIUC SERVICE IS RESTORED.
11. ENERGIZE AND TEST THE NEW MCC AND OTHER ELECTRICAL EQUIPMENT AT THE CONTROL BUILDING AND GENERATOR SHELTER.

12. FEED PANELBOARD PNL-A FROM THE NEW PERMANENT MCC, AND TRANSFER MISCELLANEOUS BUILDING AND SITE LOADS FROM THE TEMPORARY MCC TO THE PERMANENT MCC AND PNL-A WITHIN THE CONTROL BUILDING. TRANSFER OF CHLORINATION PUMPS/SYSTEM SHALL BE COORDINATED WITH TRANSFER OF WELL PUMPS TO ENSURE CONTINUED OPERATION OF THE CHLORINATION SYSTEM. SCHEDULE AND COORDINATE OUTAGES WITH DOW.
13. COORDINATE AN OUTAGE FOR WELL PUMP 1 WITH DOW. COMPLETE INSTALLATION OF THE UNDERGROUND DUCTBANK TO WELL PUMP 1 AND REPLACE ELECTRICAL EQUIPMENT AT WELL PUMP 1 AS SHOWN ON THE CONTRACT DRAWINGS. TIE IN PUMP CONTROL I/O FROM THE NEW MCC TO THE EXISTING RTU 82. COMMISSION, TEST, AND RETURN WELL PUMP 1 TO SERVICE FROM THE NEW MCC/ELECTRICAL SYSTEM. PROVE SUCCESSFUL OPERATION OF WELL PUMP 1 ON THE NEW SYSTEM TO THE SATISFACTION OF DOW.
14. COORDINATE AN OUTAGE FOR WELL PUMP 2 WITH DOW. REMOVE AND REPLACE EXISTING PUMP AND MOTOR. COMPLETE INSTALLATION OF THE UNDERGROUND DUCTBANK TO WELL PUMP 2 AND REPLACE ELECTRICAL EQUIPMENT AT WELL PUMP 2 AS SHOWN ON THE CONTRACT DRAWINGS. TIE IN PUMP CONTROL I/O FROM THE NEW MCC TO THE EXISTING RTU. COMMISSION, TEST, AND RETURN WELL PUMP 2 TO SERVICE FROM THE NEW MCC/ELECTRICAL SYSTEM. PROVE SUCCESSFUL OPERATION OF WELL PUMP 2 ON THE NEW SYSTEM TO THE SATISFACTION OF DOW.
15. TRANSFER ANY REMAINING ELECTRICAL LOADS AND CONTROL CONNECTIONS FROM THE TEMPORARY SYSTEM TO THE NEW PERMANENT SYSTEM. COORDINATE ANY OUTAGES WITH DOW AS REQUIRED.
16. DECOMMISSION THE TEMPORARY ELECTRICAL SYSTEM. SCHEDULE AN OUTAGE WITH KIUC AND DOW TO DEENERGIZE THE ELECTRICAL SERVICE. DISCONNECT AND REMOVE THE OLD ELECTRICAL SERVICE CONDUCTORS. RESTORE KIUC ELECTRICAL SERVICE. COORDINATE ALL WORK WITH KIUC AS REQUIRED.
17. DEMOLISH THE REMAINING EXISTING ELECTRICAL SERVICE EQUIPMENT AT THE CONTROL BUILDING AND ANY OTHER REMAINING EXISTING ELECTRICAL EQUIPMENT SCHEDULED FOR DEMOLITION. SALVAGE THE TEMPORARY MCC AND DELIVER TO DOW. DEMOLISH ANY REMAINING TEMPORARY ELECTRICAL EQUIPMENT, INCLUDING THE TEMPORARY MCC CONCRETE PAD, CONDUIT, AND WIRING.

<p>LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">REVISION</th> <th style="width: 10%;">DATE</th> <th style="width: 10%;">SHEET</th> <th style="width: 10%;">BY</th> <th style="width: 10%;">APPROVED</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISION	DATE	SHEET	BY	APPROVED						<p style="text-align: center;">DEPARTMENT OF WATER COUNTY OF KAUAI</p> <p style="text-align: center;">JOB NO. WKK-03</p> <p style="text-align: center;">MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2 KĪLAUEA, KAUAI, HAWAII</p> <hr/> <p style="text-align: center;">ELECTRICAL WORK SEQUENCE</p> <p>DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH</p> <p>APPROVED BY: <i>[Signature]</i> 3/11/19 DATE</p> <p style="text-align: right;">FOR: <i>[Signature]</i> MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</p>
REVISION	DATE	SHEET	BY	APPROVED								
 <p style="font-size: 8px;">THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES. *PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.*)</p> <p>BY: <i>[Signature]</i> 4/30/20 EXP. DATE</p>	<p>SHEET 34 OF 60 SHEETS E-006</p>											

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GENERAL NOTES:

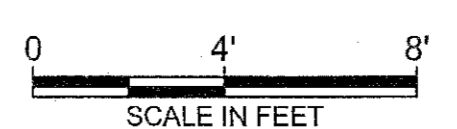
1. HATCHING INDICATES REMOVAL OF EXISTING EQUIPMENT.
2. REMOVAL WORK SHALL BE SEQUENCED CAREFULLY TO ENSURE THAT DOW'S MINIMUM OPERATIONAL REQUIREMENTS FOR THE STATION ARE MAINTAINED. SEE DWG E-001, DWG E-006, AND SP-8.2. ALSO, SEE TEMPORARY SYSTEM ELECTRICAL DRAWINGS FOR TEMPORARY SYSTEM CONFIGURATION.
3. ROUTING OF EXISTING ELECTRICAL DUCTBANK IS APPROXIMATE BASED ON RECORD DRAWINGS AND SHALL BE FIELD-VERIFIED BY THE CONTRACTOR.

KEY NOTES:

- ① REMOVE EXISTING WIRING, CONDUIT SHALL BE ABANDONED IN PLACE.
- ② REMOVE EXISTING WIRING, CONDUIT SHALL REMAIN AND BE REUSED WHERE POSSIBLE. CONTRACTOR SHALL REPLACE CORRODED CONDUIT STUB-UPS AT THE PUMP AREA, INCLUDING THE UNDERGROUND ELBOW, WITH NEW PVC-COATED GRS CONDUIT. CONTRACTOR SHALL PULL A TEST MANDREL TO ENSURE THAT EXISTING CONDUIT IS SUITABLE FOR REUSE, SWAB, AND CLEAN CONDUIT. REFER TO SP-8.4.04 FOR MANDREL TESTING REQUIREMENTS. MANDREL TESTING FOR EXISTING CONDUITS SHALL BE SIMILAR TO MANDREL TESTING FOR NEW CONDUITS. WHERE TEST MANDREL INDICATES DAMAGE OR OBSTRUCTIONS WITHIN EXISTING DUCTS, THE CONTRACTOR SHALL NOTIFY DOW.
- ③ ABANDON EXISTING PORTION OF UNDERGROUND CONDUIT BELOW THE WELL PUMP CONTROL BUILDING FLOOR. NEW CONDUIT RUNS SHALL INTERCEPT EXISTING CONDUIT JUST OUTSIDE THE BUILDING.
- ④ EXISTING CONDUITS FROM CONTROL BUILDING TO RTU ROUTED IN THIS AREA BASED ON LIMITED FIELD INVESTIGATION. CONTRACTOR SHALL FIELD-VERIFY ROUTING, SIZE, AND CONTENTS OF EXISTING CONDUITS PRIOR TO ANY DEMOLITION WORK. EXISTING CONDUITS TO REMAIN AND BE REUSED. SEE DWG E-012 FOR ADDITIONAL DETAILS. CONTRACTOR SHALL ENSURE THAT DEMOLITION WORK DESCRIBED IN KEYNOTE 3 AND NEW WORK ON DWG E-201 DOES NOT IMPACT THESE EXISTING CONDUITS.

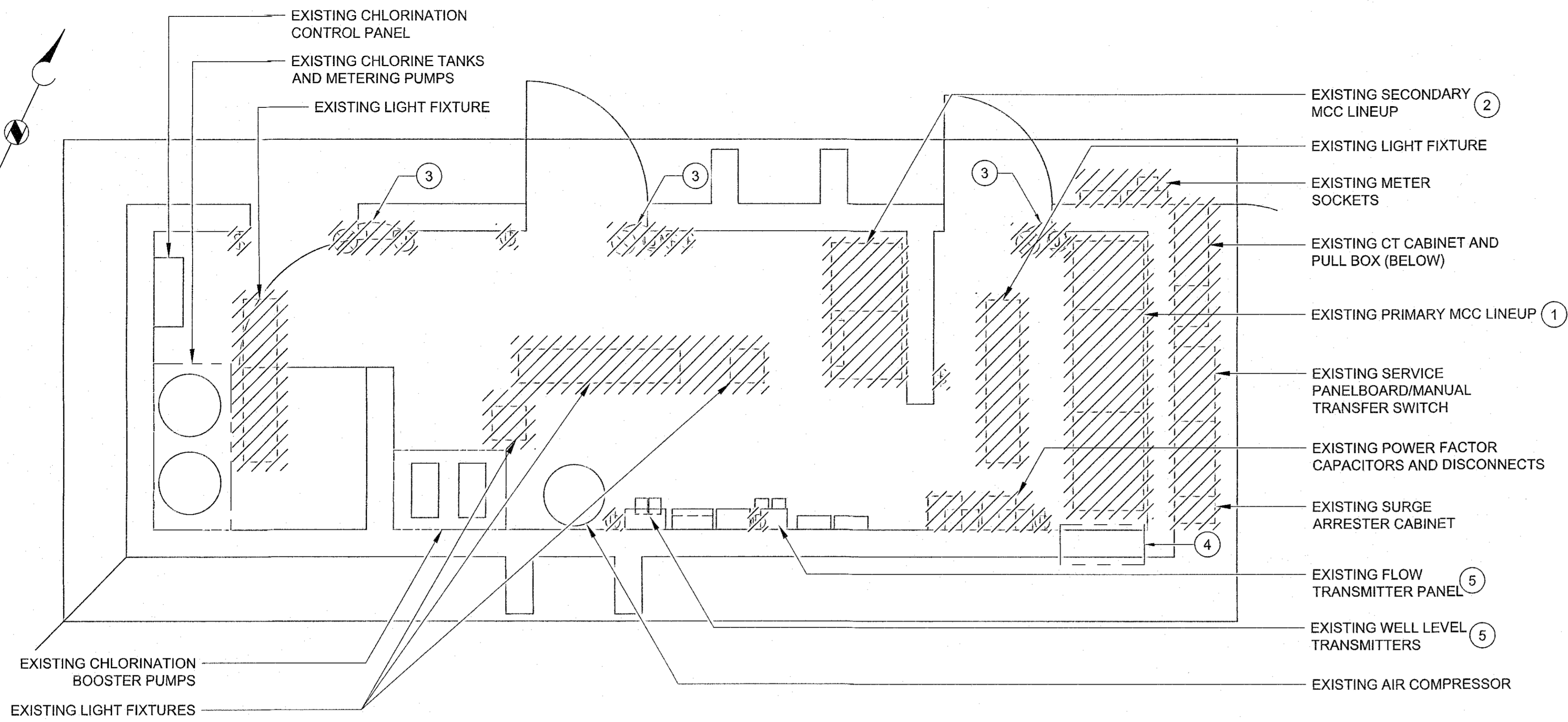
EXISTING AND REMOVAL SITE PLAN

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



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EXISTING AND REMOVAL ELECTRICAL SITE PLAN									
DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH									
APPROVED BY: DATE: 3/11/19 <small>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</small>									
SHEET 35 OF 60 SHEETS E-011									

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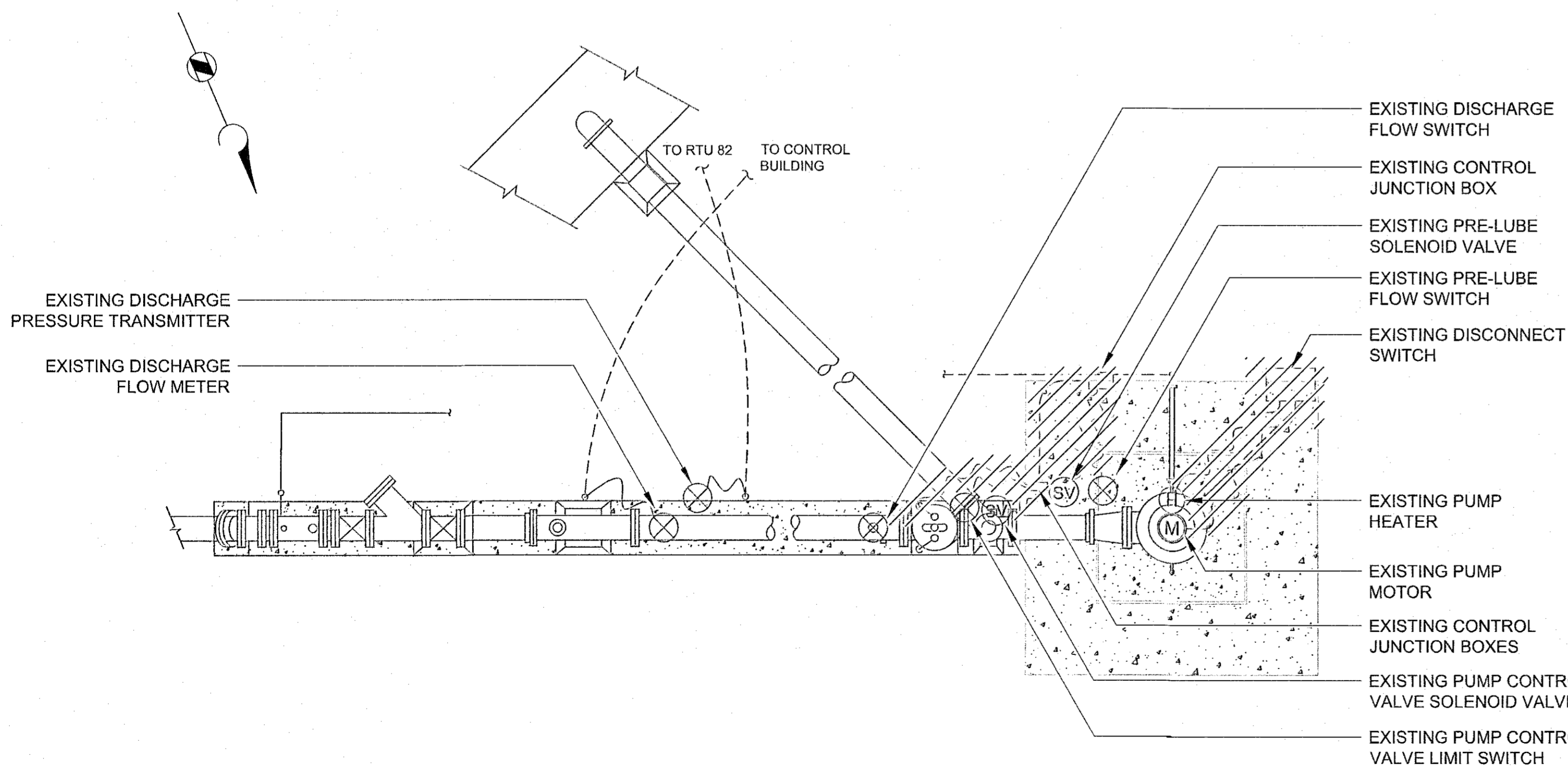
**EXISTING AND REMOVAL
 CONTROL BUILDING PLAN**
 SCALE: 1/2" = 1'-0"

GENERAL NOTES:

1. HATCHING INDICATES REMOVAL OF EXISTING EQUIPMENT.
2. REMOVAL WORK SHALL BE CAREFULLY SEQUENCED TO ENSURE THAT DOW'S MINIMUM OPERATIONAL REQUIREMENTS FOR THE STATION ARE MAINTAINED THROUGHOUT CONSTRUCTION. SEE DWG E-001, DWG E-006, AND SP-8.2. ALSO, SEE TEMPORARY SYSTEM ELECTRICAL DRAWINGS FOR TEMPORARY SYSTEM CONFIGURATION.
3. WHERE MCC OR PANELBOARD IS REMOVED, REMOVE EXISTING WIRING TO LOADS SERVED. EXISTING EXPOSED CONDUIT SHALL ALSO BE REMOVED WHERE NOT IDENTIFIED FOR REUSE.
4. REMOVE EXISTING LIGHT SWITCHES AND GENERAL-USE RECEPTACLES. REMOVE EXISTING EXPOSED CONDUIT AND WIRING TO LIGHT SWITCHES AND RECEPTACLES.
5. REMOVE EXISTING CONDUIT AND WIRING MOUNTED TO OR PENETRATING THE CEILING OF THE CONTROL BUILDING.

KEY NOTES:

- 1 EXISTING MCC CONCRETE PAD TO REMAIN AND BE REUSED WHERE PRACTICAL. SEE DWG E-203 FOR NEW WORK.
- 2 EXISTING MCC CONCRETE PAD SHALL BE REMOVED FLUSH WITH FLOOR SURFACE. SURFACE SHALL BE RESTORED TO MATCH SURROUNDING CONDITION.
- 3 REMOVE EXISTING DOOR SECURITY SWITCH MAGNETIC CONTACTS, ARMORED CABLE ASSEMBLY, JUNCTION BOX, CONDUITS, AND WIRING BACK TO TERMINAL BLOCKS IN MCC.
- 4 EXISTING CONDUITS TO RTU LOCATED IN THIS AREA BASED ON LIMITED FIELD INVESTIGATION. EXTERIOR CONDUITS SHALL REMAIN AND BE REUSED. REMOVE EXISTING WIRING BETWEEN EXISTING MCC AND RTU. REMOVE EXISTING CONDUITS INSIDE THE BUILDING TO PENETRATION AT WALL. CONTRACTOR SHALL FIELD-VERIFY ROUTING, SIZE, AND CONTENTS OF EXISTING CONDUITS PRIOR TO ANY DEMOLITION WORK.
- 5 REMOVE EXISTING CONDUIT AND WIRING FROM TRANSMITTERS TO RTU. ALSO SEE KEYNOTE 4.

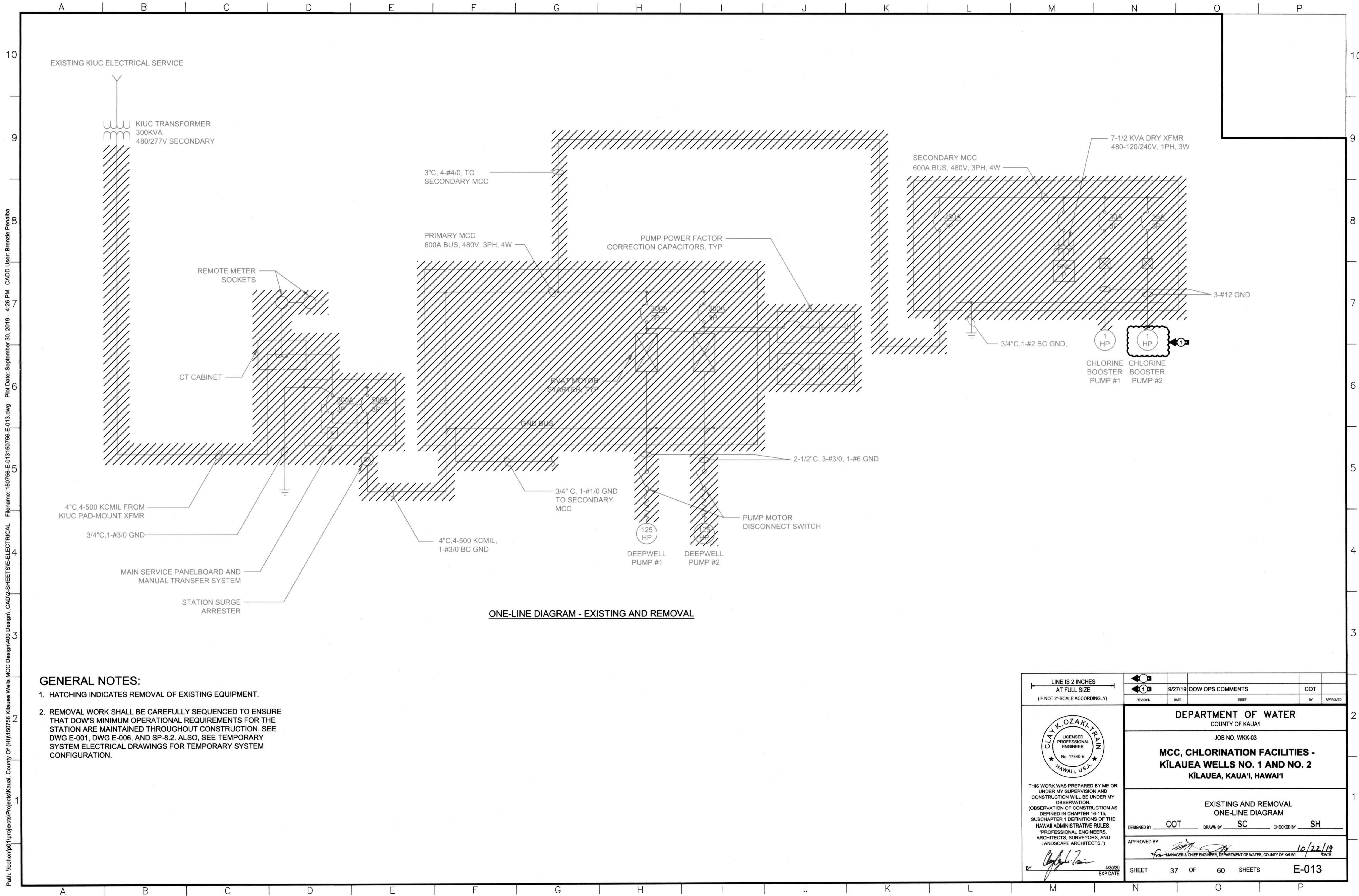


**TYPICAL EXISTING AND REMOVAL
 PUMP AREA PLAN**
 SCALE: 1/2" = 1'-0"

TYPICAL PUMP AREA REMOVAL NOTES:

1. TYPICAL PUMP AREA PLAN IS BASED ON WELL PUMP NO. 1. REMOVAL WORK FOR WELL PUMP NO. 2 IS SIMILAR, ALTHOUGH LOCATIONS OF EQUIPMENT MAY VARY.
2. EXISTING MOTOR AND HEATERS FOR WELL PUMP NO. 1 SHALL REMAIN. EXISTING MOTOR AND HEATERS FOR WELL PUMP NO. 2 SHALL BE REMOVED WITH THE PUMP. SEE MECHANICAL DEMOLITION DRAWINGS.
3. EXISTING PUMP CONTROL DEVICES AND INSTRUMENTATION SHALL REMAIN.
4. REMOVE EXISTING DISCONNECT SWITCH AND SUPPORTS.
5. REMOVE EXISTING CONTROL JUNCTION BOXES, LIQUIDTIGHT FLEXIBLE CONDUIT, AND WIRING ASSOCIATED WITH SWITCHES, SOLENOID VALVES, AND ANY OTHER PUMP CONTROL DEVICES/INSTRUMENTS.
6. EXISTING JUNCTION BOXES, FLEXIBLE CONDUIT, AND WIRING ASSOCIATED WITH PRESSURE TRANSMITTERS AND FLOW TRANSMITTERS SHALL REMAIN.

<p> <small>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.)</small> BY: <i>Clay K. Ozaki</i> 4/30/20 EXP. DATE </p>	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)								
	DEPARTMENT OF WATER COUNTY OF KAUAI JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII								
	EXISTING AND REMOVAL CONTROL BUILDING AND PUMP AREA PLANS DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH APPROVED BY: <i>Scott C. O'Neil</i> 3/11/19 DATE <small>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</small>								
SHEET 36 OF 60 SHEETS		E-012							



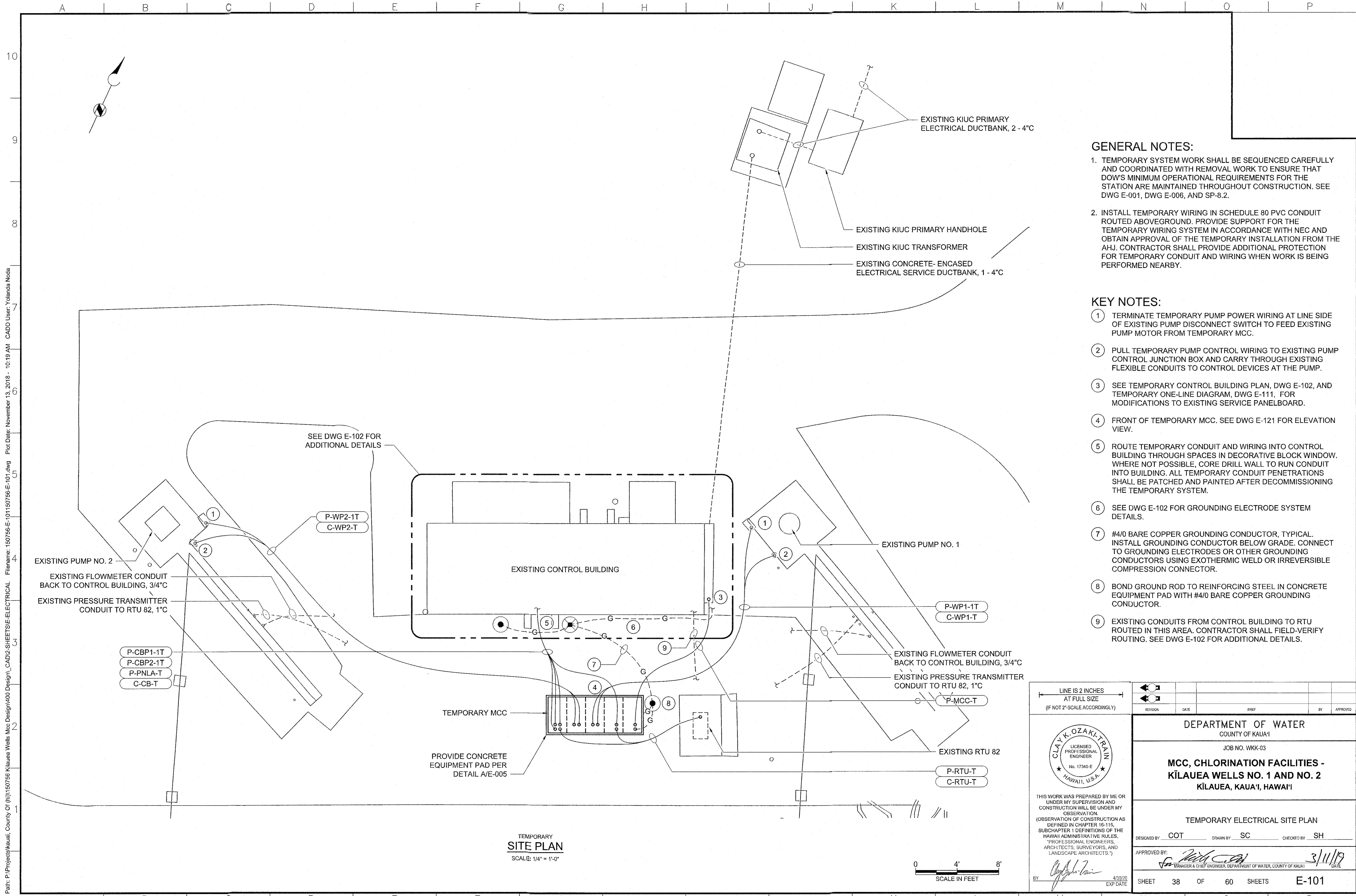
ONE-LINE DIAGRAM - EXISTING AND REMOVAL

GENERAL NOTES:

1. HATCHING INDICATES REMOVAL OF EXISTING EQUIPMENT.
2. REMOVAL WORK SHALL BE CAREFULLY SEQUENCED TO ENSURE THAT DOW'S MINIMUM OPERATIONAL REQUIREMENTS FOR THE STATION ARE MAINTAINED THROUGHOUT CONSTRUCTION. SEE DWG E-001, DWG E-006, AND SP-8.2. ALSO, SEE TEMPORARY SYSTEM ELECTRICAL DRAWINGS FOR TEMPORARY SYSTEM CONFIGURATION.

<p>LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)</p>	<p>9/27/19</p>	<p>DOW OPS COMMENTS</p>	<p>COT</p>	
	<p>REVISION</p>	<p>DATE</p>	<p>BREF</p>	<p>BY</p>
<p>DEPARTMENT OF WATER COUNTY OF KAUAI</p>				
<p>JOB NO. WKK-03</p>				
<p>MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2 KĪLAUEA, KAUAI, HAWAII</p>				
<p>EXISTING AND REMOVAL ONE-LINE DIAGRAM</p>				
<p>DESIGNED BY: COT</p>		<p>DRAWN BY: SC</p>		
<p>CHECKED BY: SH</p>		<p>APPROVED BY: </p>		
<p>BY: </p>		<p>DATE: 10/22/19</p>		
<p>4/30/20 EXP DATE</p>		<p>SHEET 37 OF 60 SHEETS</p>		
<p>E-013</p>		<p>E-013</p>		

Path: \\bchontf01\projects\Projects\Kauai, County Of (H)\150756 Kilauea Wells, MCC Design\400 Design\CADD\SHEETS\ELECTRICAL File Name: 150756-E-013\150756-E-013.dwg Plot Date: September 30, 2019 - 4:26 PM CADD User: Brenzlie Penalba



GENERAL NOTES:

1. TEMPORARY SYSTEM WORK SHALL BE SEQUENCED CAREFULLY AND COORDINATED WITH REMOVAL WORK TO ENSURE THAT DOW'S MINIMUM OPERATIONAL REQUIREMENTS FOR THE STATION ARE MAINTAINED THROUGHOUT CONSTRUCTION. SEE DWG E-001, DWG E-006, AND SP-8.2.
2. INSTALL TEMPORARY WIRING IN SCHEDULE 80 PVC CONDUIT ROUTED ABOVEGROUND. PROVIDE SUPPORT FOR THE TEMPORARY WIRING SYSTEM IN ACCORDANCE WITH NEC AND OBTAIN APPROVAL OF THE TEMPORARY INSTALLATION FROM THE AHJ. CONTRACTOR SHALL PROVIDE ADDITIONAL PROTECTION FOR TEMPORARY CONDUIT AND WIRING WHEN WORK IS BEING PERFORMED NEARBY.

KEY NOTES:

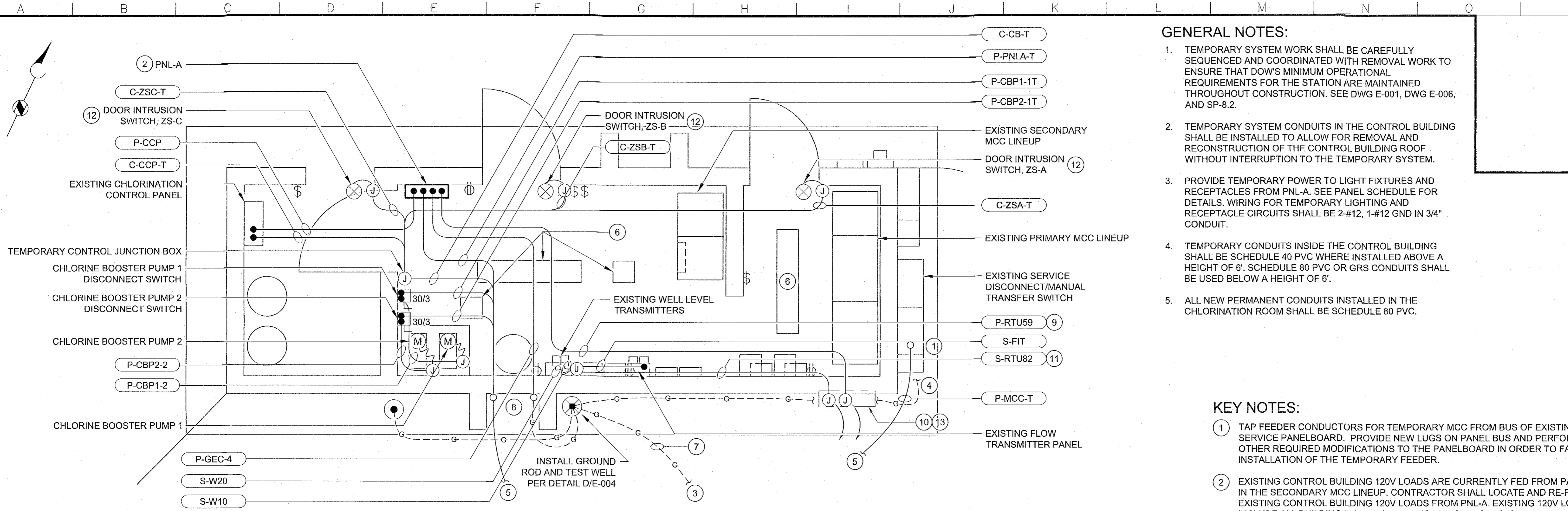
- 1 TERMINATE TEMPORARY PUMP POWER WIRING AT LINE SIDE OF EXISTING PUMP DISCONNECT SWITCH TO FEED EXISTING PUMP MOTOR FROM TEMPORARY MCC.
- 2 PULL TEMPORARY PUMP CONTROL WIRING TO EXISTING PUMP CONTROL JUNCTION BOX AND CARRY THROUGH EXISTING FLEXIBLE CONDUITS TO CONTROL DEVICES AT THE PUMP.
- 3 SEE TEMPORARY CONTROL BUILDING PLAN, DWG E-102, AND TEMPORARY ONE-LINE DIAGRAM, DWG E-111, FOR MODIFICATIONS TO EXISTING SERVICE PANELBOARD.
- 4 FRONT OF TEMPORARY MCC. SEE DWG E-121 FOR ELEVATION VIEW.
- 5 ROUTE TEMPORARY CONDUIT AND WIRING INTO CONTROL BUILDING THROUGH SPACES IN DECORATIVE BLOCK WINDOW. WHERE NOT POSSIBLE, CORE DRILL WALL TO RUN CONDUIT INTO BUILDING. ALL TEMPORARY CONDUIT PENETRATIONS SHALL BE PATCHED AND PAINTED AFTER DECOMMISSIONING THE TEMPORARY SYSTEM.
- 6 SEE DWG E-102 FOR GROUNDING ELECTRODE SYSTEM DETAILS.
- 7 #4/0 BARE COPPER GROUNDING CONDUCTOR, TYPICAL. INSTALL GROUNDING CONDUCTOR BELOW GRADE. CONNECT TO GROUNDING ELECTRODES OR OTHER GROUNDING CONDUCTORS USING EXOTHERMIC WELD OR IRREVERSIBLE COMPRESSION CONNECTOR.
- 8 BOND GROUND ROD TO REINFORCING STEEL IN CONCRETE EQUIPMENT PAD WITH #4/0 BARE COPPER GROUNDING CONDUCTOR.
- 9 EXISTING CONDUITS FROM CONTROL BUILDING TO RTU ROUTED IN THIS AREA. CONTRACTOR SHALL FIELD-VERIFY ROUTING. SEE DWG E-102 FOR ADDITIONAL DETAILS.

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

<p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES. *PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.*)</p> <p>BY: <i>Clay K. Ozaki-Tam</i> 4/30/20 EXP. DATE</p>	<p>LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)</p>									
	<table border="1"> <thead> <tr> <th>REVISION</th> <th>DATE</th> <th>SHEET</th> <th>BY</th> <th>APPROVED</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISION	DATE	SHEET	BY	APPROVED				
REVISION	DATE	SHEET	BY	APPROVED						
<p>DEPARTMENT OF WATER COUNTY OF KAUAI</p> <p>JOB NO. WKX-03</p> <p>MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2 KĪLAUEA, KAUAI, HAWAII</p>										
<p>TEMPORARY ELECTRICAL SITE PLAN</p> <p>DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH</p> <p>APPROVED BY: <i>[Signature]</i> 3/11/19 MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI DATE</p>										
<p>SHEET 38 OF 60 SHEETS E-101</p>										

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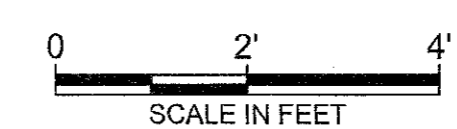


**TEMPORARY
CONTROL BUILDING PLAN**
 SCALE: 1/2" = 1'-0"

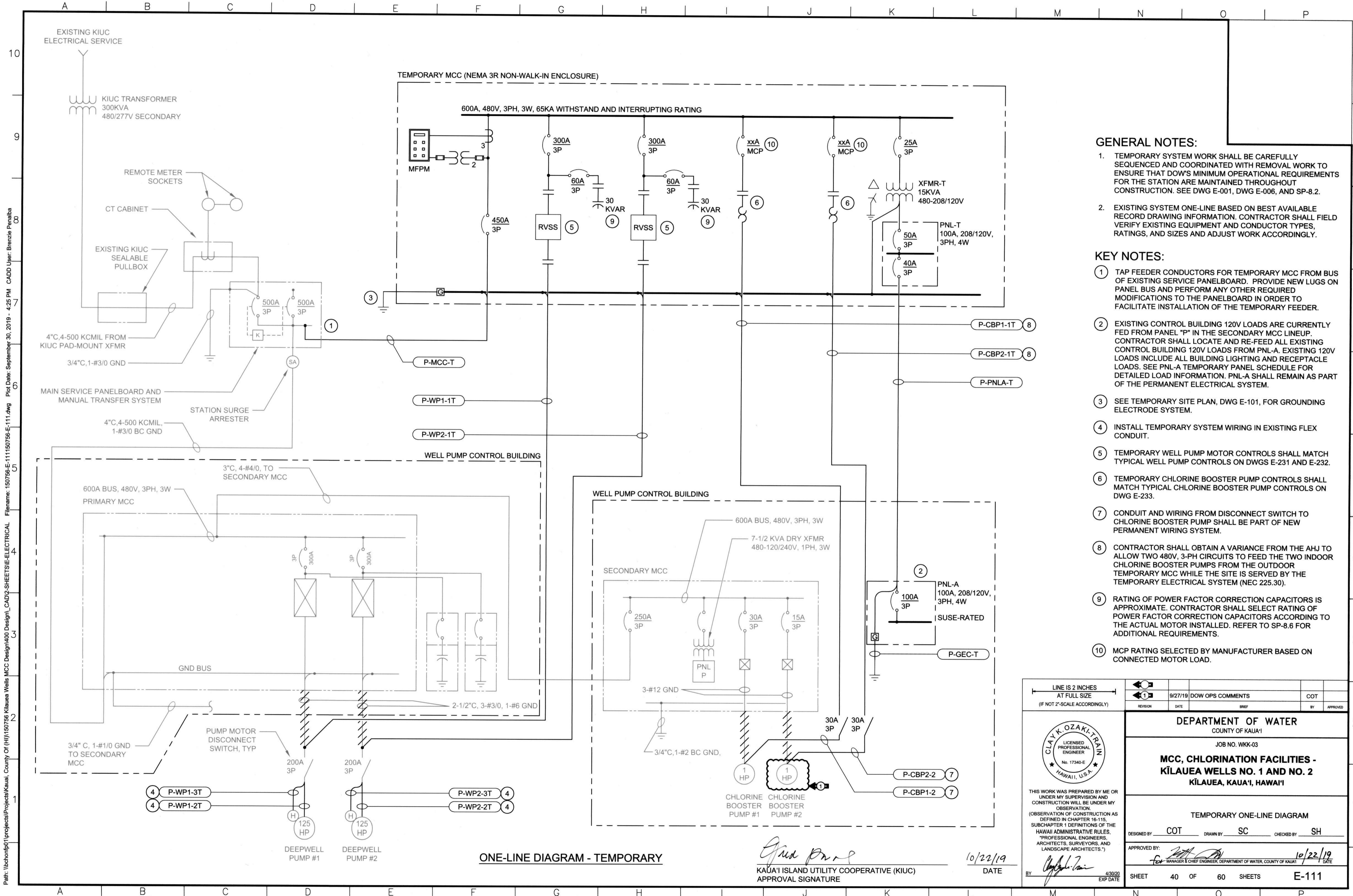
- GENERAL NOTES:**
- TEMPORARY SYSTEM WORK SHALL BE CAREFULLY SEQUENCED AND COORDINATED WITH REMOVAL WORK TO ENSURE THAT DOW'S MINIMUM OPERATIONAL REQUIREMENTS FOR THE STATION ARE MAINTAINED THROUGHOUT CONSTRUCTION. SEE DWG E-001, DWG E-006, AND SP-8.2.
 - TEMPORARY SYSTEM CONDUITS IN THE CONTROL BUILDING SHALL BE INSTALLED TO ALLOW FOR REMOVAL AND RECONSTRUCTION OF THE CONTROL BUILDING ROOF WITHOUT INTERRUPTION TO THE TEMPORARY SYSTEM.
 - PROVIDE TEMPORARY POWER TO LIGHT FIXTURES AND RECEPTACLES FROM PNL-A. SEE PANEL SCHEDULE FOR DETAILS. WIRING FOR TEMPORARY LIGHTING AND RECEPTACLE CIRCUITS SHALL BE 2-#12, 1-#12 GND IN 3/4" CONDUIT.
 - TEMPORARY CONDUITS INSIDE THE CONTROL BUILDING SHALL BE SCHEDULE 40 PVC WHERE INSTALLED ABOVE A HEIGHT OF 6'. SCHEDULE 80 PVC OR GRS CONDUITS SHALL BE USED BELOW A HEIGHT OF 6'.
 - ALL NEW PERMANENT CONDUITS INSTALLED IN THE CHLORINATION ROOM SHALL BE SCHEDULE 80 PVC.

- KEY NOTES:**
- TAP FEEDER CONDUCTORS FOR TEMPORARY MCC FROM BUS OF EXISTING SERVICE PANELBOARD. PROVIDE NEW LUGS ON PANEL BUS AND PERFORM ANY OTHER REQUIRED MODIFICATIONS TO THE PANELBOARD IN ORDER TO FACILITATE INSTALLATION OF THE TEMPORARY FEEDER.
 - EXISTING CONTROL BUILDING 120V LOADS ARE CURRENTLY FED FROM PANEL "P" IN THE SECONDARY MCC LINEUP. CONTRACTOR SHALL LOCATE AND RE-FEED ALL EXISTING CONTROL BUILDING 120V LOADS FROM PNL-A. EXISTING 120V LOADS INCLUDE ALL BUILDING LIGHTING AND RECEPTACLE LOADS. SEE PANEL SCHEDULES FOR DETAILED LOAD INFORMATION. PNL-A SHALL REMAIN AS PART OF THE PERMANENT ELECTRICAL SYSTEM.
 - TO TEMPORARY MCC GROUNDING ELECTRODE, SEE DWG E-101.
 - BOND TO EXISTING BUILDING GROUNDING ELECTRODE SYSTEM. ROUTE CONDUCTOR SO AS TO AVOID DAMAGE FROM EXCAVATION DURING INSTALLATION OF THE NEW PERMANENT ELECTRICAL SYSTEM, SEE DWG E-203.
 - FOR CONTINUATION SEE DWG E-101.
 - EXISTING LIGHT FIXTURES MUST BE REMOVED TO ALLOW REMOVAL AND RECONSTRUCTION OF THE CONTROL BUILDING ROOF. CONTRACTOR SHALL PROVIDE TEMPORARY LIGHTING SYSTEM FOR THE CONTROL BUILDING DURING THE REPLACEMENT OF THE ROOF. TEMPORARY LIGHTING SYSTEM SHALL PROVIDE LIGHTING LEVELS EQUIVALENT TO THE EXISTING SYSTEM. FEED TEMPORARY LIGHTING SYSTEM FROM PNL-A.
 - #4/0 BARE COPPER GROUNDING CONDUCTOR, TYPICAL. INSTALL GROUNDING CONDUCTOR BELOW GRADE. CONNECT TO GROUNDING ELECTRODES OR OTHER GROUNDING CONDUCTORS USING EXOTHERMIC WELD OR IRREVERSIBLE COMPRESSION CONNECTOR.
 - ROUTE TEMPORARY CONDUIT AND WIRING INTO CONTROL BUILDING THROUGH SPACES IN DECORATIVE BLOCK WINDOW. WHERE NOT POSSIBLE, CORE DRILL WALL TO RUN CONDUIT INTO BUILDING. ALL TEMPORARY CONDUIT PENETRATIONS SHALL BE PATCHED AND PAINTED AFTER DECOMMISSIONING THE TEMPORARY SYSTEM.

- KEY NOTES (CONTINUED):**
- 120V POWER CIRCUIT TO RESERVOIR RTU 59 (CURRENTLY FED FROM PANEL "P"). CONTRACTOR SHALL LOCATE AND TRACE EXISTING CONDUIT TO RTU 59 AND TIE IN NEW CONDUIT TO EXISTING CONDUIT TO RTU 59 AT THE EXTERIOR OF THE CONTROL BUILDING. SPLICE NEW WIRING TO EXISTING. PROVIDE JUNCTION BOX WHERE REQUIRED TO PERFORM SPLICE. SEE PNL-A TEMPORARY PANEL SCHEDULE ON DWG E-141.
 - EXISTING CONDUITS TO RTU 59 AND RTU 82 ARE ROUTED IN THIS AREA BASED ON LIMITED FIELD INVESTIGATION. CONTRACTOR SHALL VERIFY ROUTING AND CONTENTS OF EXISTING CONDUITS.
 - 4-20mA SIGNAL CONDUIT FROM CONTROL BUILDING TO RTU 82 FOR LEVEL TRANSMITTERS AND FLOW TRANSMITTERS. CONTRACTOR SHALL LOCATE AND TRACE EXISTING SIGNAL CONDUIT TO RTU 82 AND TIE IN NEW CONDUIT IN THE CONTROL BUILDING TO EXISTING CONDUIT TO RTU 82 AT THE EXTERIOR OF THE CONTROL BUILDING. PROVIDE JUNCTION BOX TO FACILITATE CONNECTION. WIRING SHALL BE ALL NEW FROM TRANSMITTERS TO TERMINALS AT RTU, SPLICING SHALL NOT BE ALLOWED.
 - INSTALL NEW DOOR INTRUSION SWITCHES AS SOON AS PRACTICAL AFTER RECONSTRUCTION OF THE CONTROL BUILDING ROOF AND REPLACEMENT OF DOORS. SEE ADDITIONAL INSTALLATION DETAILS ON DWG E-203.
 - CORE-DRILL THE WALL TO ROUTE NEW CONDUITS OUTSIDE TO CONNECT TO EXISTING CONDUITS. PATCH WITH STRUCTURAL NON-SHRINK GROUT AND PAINT TO MATCH SURROUNDING SURFACE. COORDINATE WORK WITH STRUCTURAL WORK TO RAISE THE WALL HEIGHT. SEE STRUCTURAL DRAWINGS FOR ADDITIONAL DETAILS.



<p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-116, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.")</p> <p>BY: <i>Clay K. Ozaki-Tam</i> 4/30/20 EXP. DATE</p>	DEPARTMENT OF WATER COUNTY OF KAUAI JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII				
	TEMPORARY CONTROL BUILDING PLAN DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH				
	APPROVED BY: <i>[Signature]</i> 3/11/19 DATE MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI				
	SHEET 39 OF 60 SHEETS E-102				



- GENERAL NOTES:**
- TEMPORARY SYSTEM WORK SHALL BE CAREFULLY SEQUENCED AND COORDINATED WITH REMOVAL WORK TO ENSURE THAT DOW'S MINIMUM OPERATIONAL REQUIREMENTS FOR THE STATION ARE MAINTAINED THROUGHOUT CONSTRUCTION. SEE DWG E-001, DWG E-006, AND SP-8.2.
 - EXISTING SYSTEM ONE-LINE BASED ON BEST AVAILABLE RECORD DRAWING INFORMATION. CONTRACTOR SHALL FIELD VERIFY EXISTING EQUIPMENT AND CONDUCTOR TYPES, RATINGS, AND SIZES AND ADJUST WORK ACCORDINGLY.

- KEY NOTES:**
- TAP FEEDER CONDUCTORS FOR TEMPORARY MCC FROM BUS OF EXISTING SERVICE PANELBOARD. PROVIDE NEW LUGS ON PANEL BUS AND PERFORM ANY OTHER REQUIRED MODIFICATIONS TO THE PANELBOARD IN ORDER TO FACILITATE INSTALLATION OF THE TEMPORARY FEEDER.
 - EXISTING CONTROL BUILDING 120V LOADS ARE CURRENTLY FED FROM PANEL "P" IN THE SECONDARY MCC LINEUP. CONTRACTOR SHALL LOCATE AND RE-FEED ALL EXISTING CONTROL BUILDING 120V LOADS FROM PNL-A. EXISTING 120V LOADS INCLUDE ALL BUILDING LIGHTING AND RECEPTACLE LOADS. SEE PNL-A TEMPORARY PANEL SCHEDULE FOR DETAILED LOAD INFORMATION. PNL-A SHALL REMAIN AS PART OF THE PERMANENT ELECTRICAL SYSTEM.
 - SEE TEMPORARY SITE PLAN, DWG E-101, FOR GROUNDING ELECTRODE SYSTEM.
 - INSTALL TEMPORARY SYSTEM WIRING IN EXISTING FLEX CONDUIT.
 - TEMPORARY WELL PUMP MOTOR CONTROLS SHALL MATCH TYPICAL WELL PUMP CONTROLS ON DWGS E-231 AND E-232.
 - TEMPORARY CHLORINE BOOSTER PUMP CONTROLS SHALL MATCH TYPICAL CHLORINE BOOSTER PUMP CONTROLS ON DWG E-233.
 - CONDUIT AND WIRING FROM DISCONNECT SWITCH TO CHLORINE BOOSTER PUMP SHALL BE PART OF NEW PERMANENT WIRING SYSTEM.
 - CONTRACTOR SHALL OBTAIN A VARIANCE FROM THE AHJ TO ALLOW TWO 480V, 3-PH CIRCUITS TO FEED THE TWO INDOOR CHLORINE BOOSTER PUMPS FROM THE OUTDOOR TEMPORARY MCC WHILE THE SITE IS SERVED BY THE TEMPORARY ELECTRICAL SYSTEM (NEC 225.30).
 - RATING OF POWER FACTOR CORRECTION CAPACITORS IS APPROXIMATE. CONTRACTOR SHALL SELECT RATING OF POWER FACTOR CORRECTION CAPACITORS ACCORDING TO THE ACTUAL MOTOR INSTALLED. REFER TO SP-8.6 FOR ADDITIONAL REQUIREMENTS.
 - MCP RATING SELECTED BY MANUFACTURER BASED ON CONNECTED MOTOR LOAD.

	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)		9/27/19	DOW OPS COMMENTS	COT
	REVISION	DATE	BRIEF	BY	APPROVED
DEPARTMENT OF WATER COUNTY OF KAUAI					
JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2 KĪLAUEA, KAUAI, HAWAII					
TEMPORARY ONE-LINE DIAGRAM					
DESIGNED BY: COT		DRAWN BY: SC		CHECKED BY: SH	
APPROVED BY:					
10/22/19 DATE					
SHEET 40 OF 60 SHEETS		E-111			

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ONE-LINE DIAGRAM - TEMPORARY
 KAUA'I ISLAND UTILITY COOPERATIVE (KIUC)
 APPROVAL SIGNATURE DATE 10/22/19

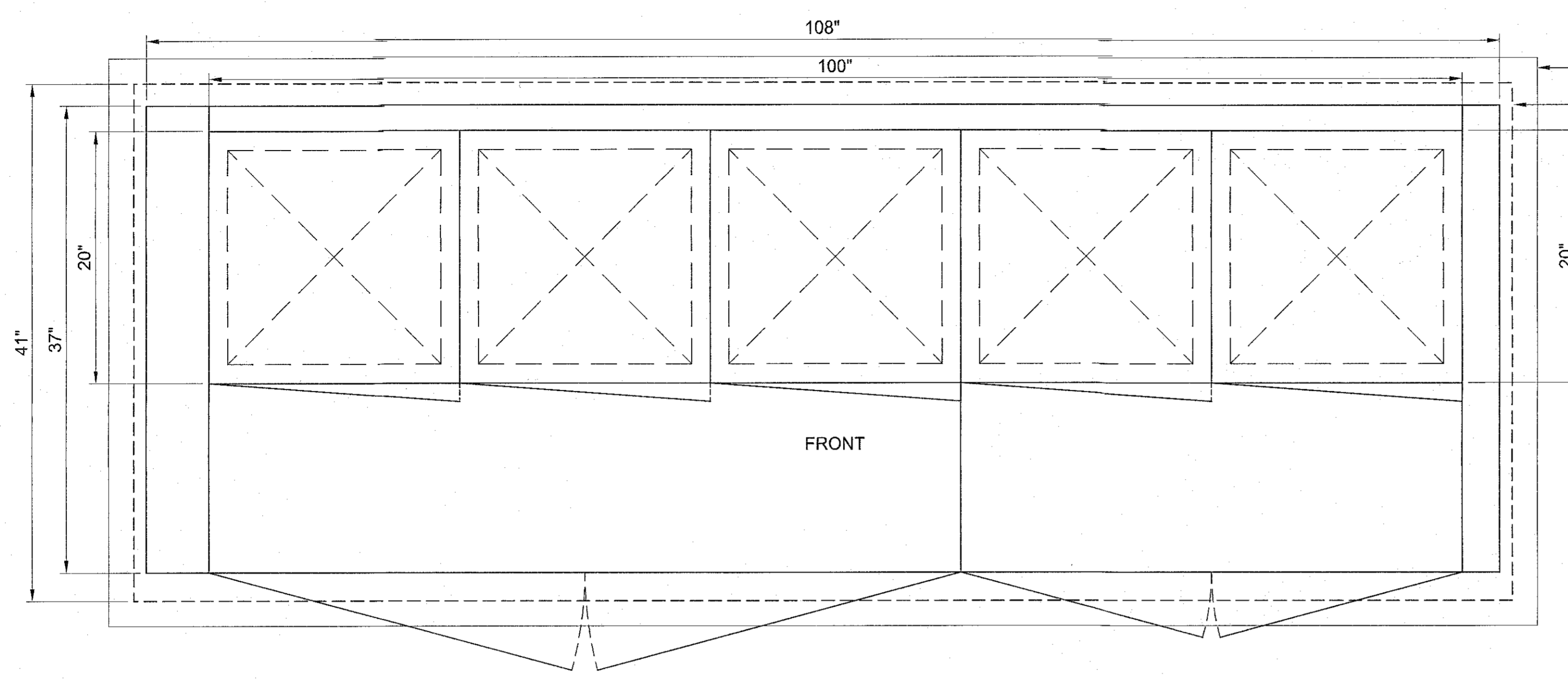
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GENERAL NOTES:

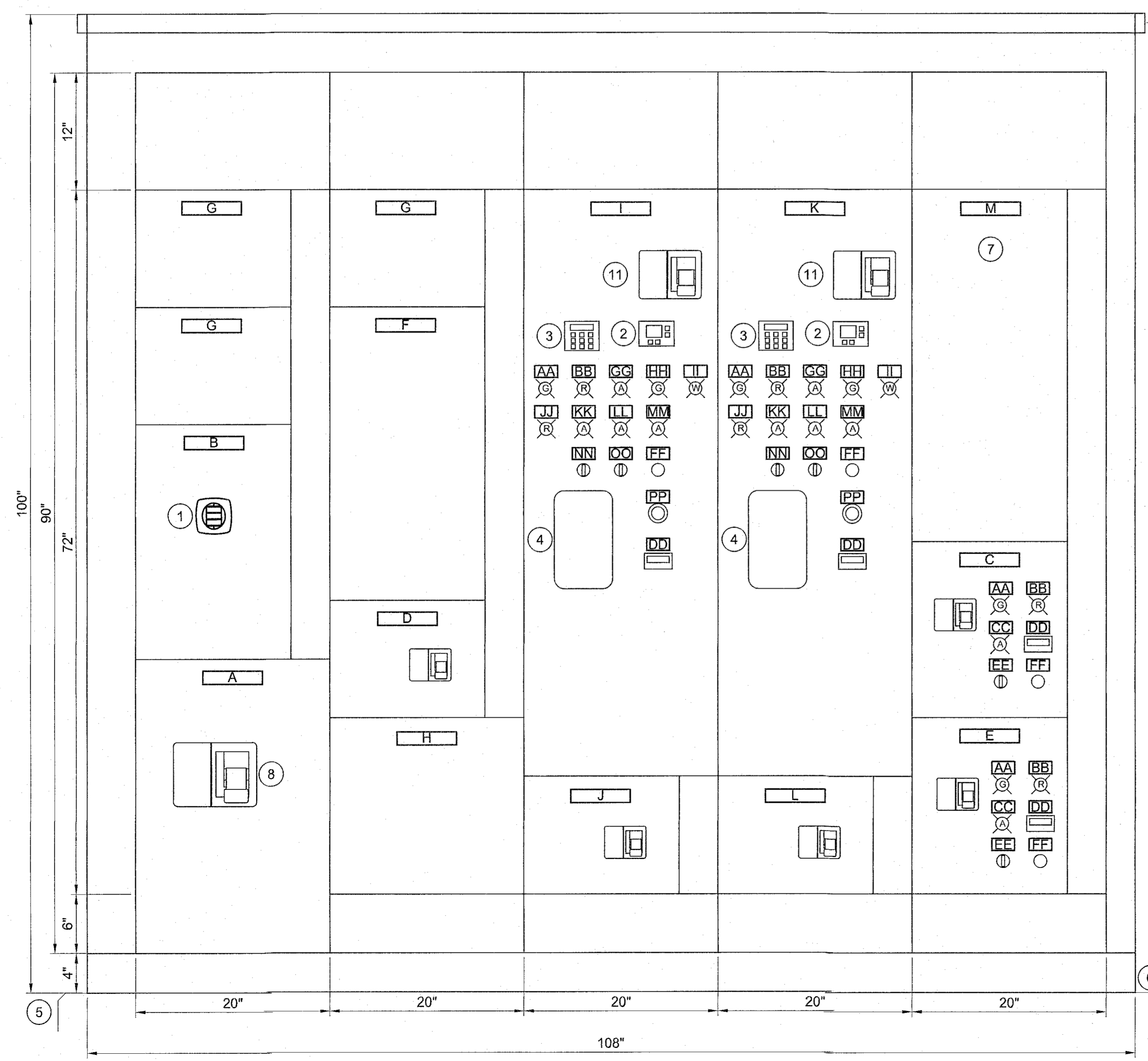
- TEMPORARY MCC SHALL BE PROVIDED WITH A NEMA 3R ENCLOSURE SUITABLE FOR OUTDOOR INSTALLATION. ENCLOSURE SHALL HAVE SLANTED ROOF TO SHED WATER.
- CONTRACTOR SHALL ENSURE THAT THE INSTALLED HEIGHT OF ANY CIRCUIT BREAKER OPERATING HANDLE DOES NOT EXCEED 6'-7" IN THE HIGHEST POSITION.

KEY NOTES:

- MULTI-FUNCTION POWER MONITOR.
- RVSS EXTERNAL DISPLAY AND CONTROL MODULE.
- MOTOR PROTECTION RELAY REMOTE OPERATOR INTERFACE.
- MECHANICAL TIMECLOCK FOR OPERATING WELL PUMP IN TIMER MODE. MOUNT TO FACE OF PUMP STARTER CABINET.
- 6" HIGH (ABOVE GRADE) OUTDOOR CONCRETE EQUIPMENT PAD PER DETAIL A/E-005. EQUIPMENT PAD SHALL EXTEND 2" BEYOND FOOTPRINT OF EQUIPMENT ON ALL SIDES.
- ANCHOR MCC PER DETAIL E/E-003.
- PROVIDE TERMINAL BLOCKS FOR FIELD WIRING TO SCADA CABINET PER TEMPORARY SCADA I/O WIRING DIAGRAMS, DWGS E-131 AND E-132. SIZE CUBICLE AS REQUIRED TO ACCOMMODATE REQUIRED NUMBER OF TERMINAL BLOCKS.
- CIRCUIT BREAKER EXTERNAL OPERATING HANDLE, TYPICAL.
- ELEVATION VIEW SHOWN WITHOUT DOORS FOR CLARITY.
- ROOF OF NEMA 3R ENCLOSURE.
- PROVIDE LABEL WARNING OF MULTIPLE SOURCES OF POWER/VOLTAGE WITHIN CUBICLE. LABEL SHALL NOTE WHICH EXTERNAL CIRCUITS PROVIDE POWER TO THE CUBICLE.



MCC PLAN VIEW
NO SCALE



MCC ELEVATION
NO SCALE

NAMEPLATES	
ITEM	DESCRIPTION
A	MAIN BREAKER
B	POWER MONITOR
C	CHLORINE BOOSTER PUMP 1
D	TRANSFORMER-T CIRCUIT BREAKER
E	CHLORINE BOOSTER PUMP 2
F	PNL-T, 100A, 208/120V, 3PH, 4W
G	SPACE
H	TRANSFORMER-T, 15 KVA, 480V-208/120V
I	WELL PUMP 1
J	WELL PUMP 1 CAPACITORS
K	WELL PUMP 2
L	WELL PUMP 2 CAPACITORS
M	SCADA TERMINAL CABINET

ABOVE NAMEPLATES TO BE 9" X 2-1/4" X 1/8" BLACK WITH 5/8" WHITE LETTERING & BEVELED EDGES

NAMEPLATES	
ITEM	DESCRIPTION
AA	MOTOR STOPPED
BB	MOTOR RUNNING
CC	OVERLOAD
DD	ELAPSED RUN TIME
EE	HAND - OFF - AUTO
FF	RESET
GG	TROUBLE
HH	READY
II	ON SUPERVISORY
JJ	PUMP DISCHARGE FLOW
KK	NO DISCHARGE FLOW
LL	NO PRE-LUBE FLOW
MM	HIGH DISCHARGE PRESSURE
NN	HAND - OFF - AUTO - TIMER
OO	NORMAL - TEST
PP	ESTOP

ABOVE NAMEPLATES TO BE 4" X 2" X 1/8" BLACK WITH 1/4" WHITE LETTERING & BEVELED EDGES

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.")

BY: *Clay K. Ozaki* 4/30/20 EXP DATE

REVISION	DATE	BY	APPROVED

DEPARTMENT OF WATER
COUNTY OF KAUAI

JOB NO. WKK-03

MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII

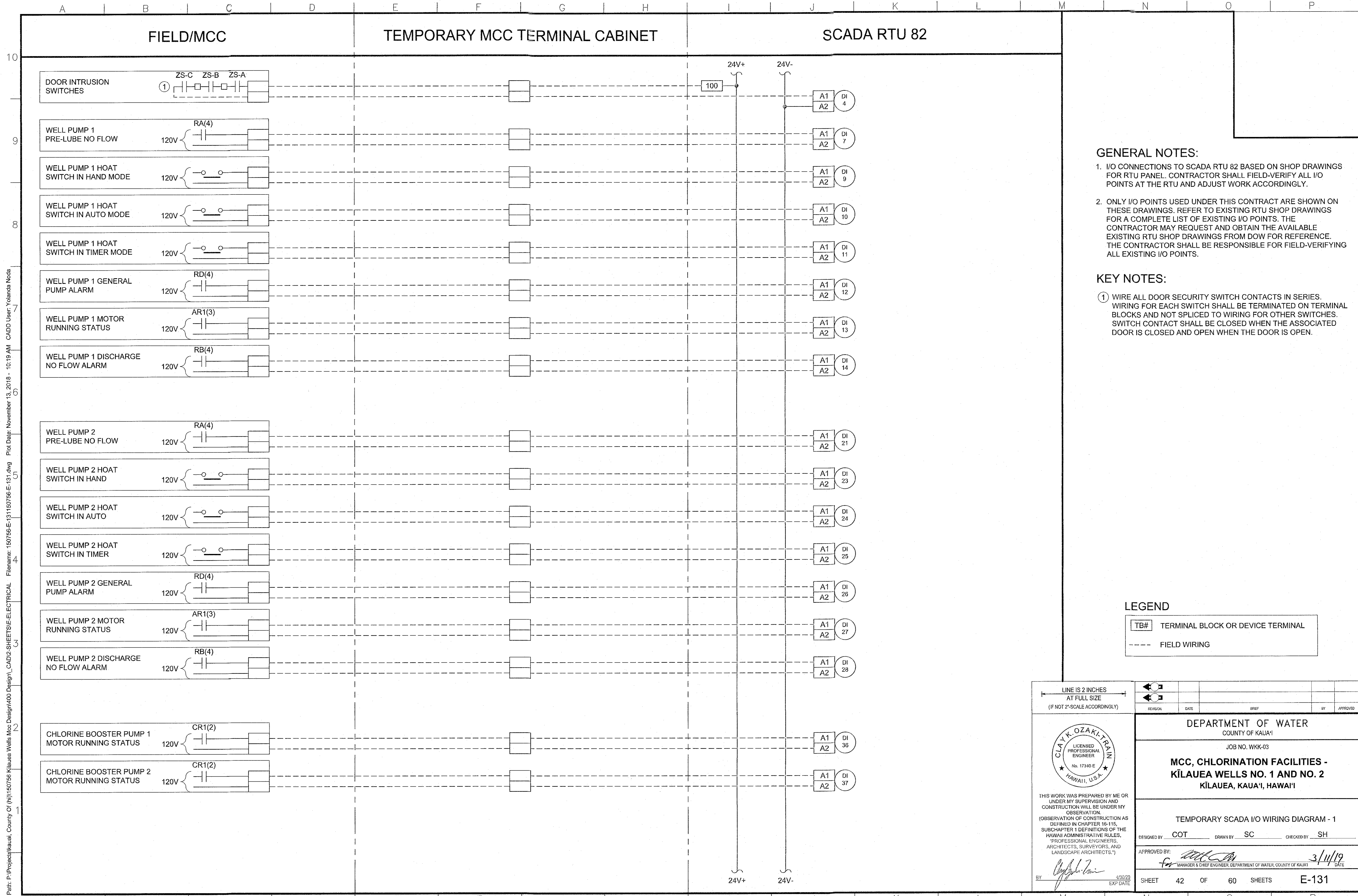
TEMPORARY MCC ELEVATION

DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH

APPROVED BY: *[Signature]* 3/1/19 DATE

MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI

SHEET 41 OF 60 SHEETS E-121



GENERAL NOTES:

1. I/O CONNECTIONS TO SCADA RTU 82 BASED ON SHOP DRAWINGS FOR RTU PANEL. CONTRACTOR SHALL FIELD-VERIFY ALL I/O POINTS AT THE RTU AND ADJUST WORK ACCORDINGLY.
2. ONLY I/O POINTS USED UNDER THIS CONTRACT ARE SHOWN ON THESE DRAWINGS. REFER TO EXISTING RTU SHOP DRAWINGS FOR A COMPLETE LIST OF EXISTING I/O POINTS. THE CONTRACTOR MAY REQUEST AND OBTAIN THE AVAILABLE EXISTING RTU SHOP DRAWINGS FROM DOW FOR REFERENCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-VERIFYING ALL EXISTING I/O POINTS.

KEY NOTES:

- ① WIRE ALL DOOR SECURITY SWITCH CONTACTS IN SERIES. WIRING FOR EACH SWITCH SHALL BE TERMINATED ON TERMINAL BLOCKS AND NOT SPliced TO WIRING FOR OTHER SWITCHES. SWITCH CONTACT SHALL BE CLOSED WHEN THE ASSOCIATED DOOR IS CLOSED AND OPEN WHEN THE DOOR IS OPEN.

LEGEND

TB#	TERMINAL BLOCK OR DEVICE TERMINAL
---	FIELD WIRING

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

REVISION	DATE	BY	APPROVED

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BY: *Clay K. Ozaki* 4/30/20 EXP DATE

DEPARTMENT OF WATER
COUNTY OF KAUAI

JOB NO. WKK-03

MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2
KĪLAUEA, KAUAI, HAWAII

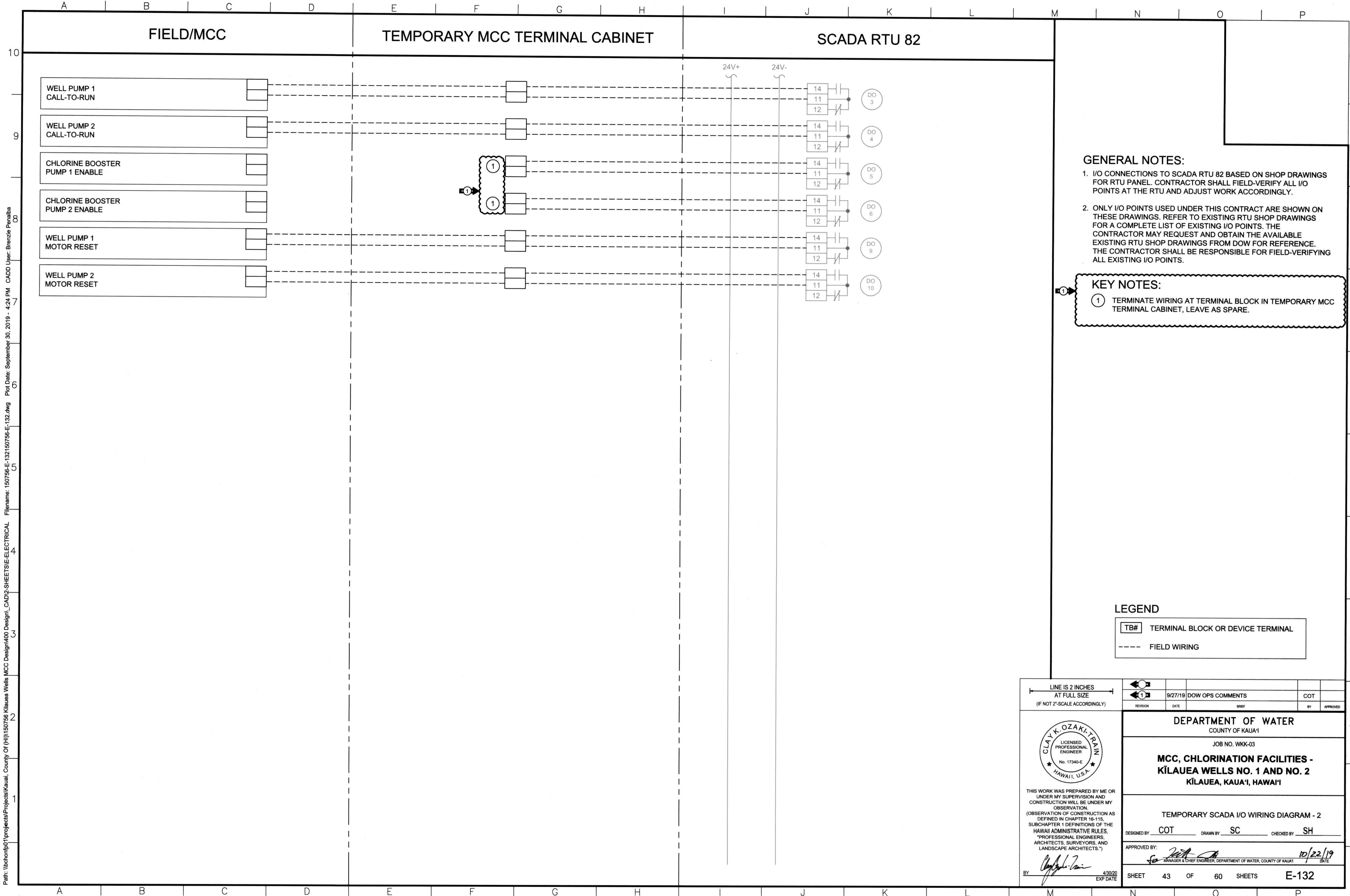
TEMPORARY SCADA I/O WIRING DIAGRAM - 1

DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH

APPROVED BY: *[Signature]* 3/11/19 DATE
MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI

SHEET 42 OF 60 SHEETS E-131

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GENERAL NOTES:

1. I/O CONNECTIONS TO SCADA RTU 82 BASED ON SHOP DRAWINGS FOR RTU PANEL. CONTRACTOR SHALL FIELD-VERIFY ALL I/O POINTS AT THE RTU AND ADJUST WORK ACCORDINGLY.
2. ONLY I/O POINTS USED UNDER THIS CONTRACT ARE SHOWN ON THESE DRAWINGS. REFER TO EXISTING RTU SHOP DRAWINGS FOR A COMPLETE LIST OF EXISTING I/O POINTS. THE CONTRACTOR MAY REQUEST AND OBTAIN THE AVAILABLE EXISTING RTU SHOP DRAWINGS FROM DOW FOR REFERENCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-VERIFYING ALL EXISTING I/O POINTS.

KEY NOTES:

1. TERMINATE WIRING AT TERMINAL BLOCK IN TEMPORARY MCC TERMINAL CABINET, LEAVE AS SPARE.

LEGEND

TB# TERMINAL BLOCK OR DEVICE TERMINAL
 ---- FIELD WIRING

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

REVISION	DATE	BRIEF	BY	APPROVED
1	9/27/19	DOW OPS COMMENTS	COT	

DEPARTMENT OF WATER
 COUNTY OF KAUAI

JOB NO. WKK-03

MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2
 KILAUEA, KAUAI, HAWAII

TEMPORARY SCADA I/O WIRING DIAGRAM - 2

DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH

APPROVED BY: *[Signature]* 10/22/19
 MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI DATE

BY: *[Signature]* 4/30/20 EXP DATE

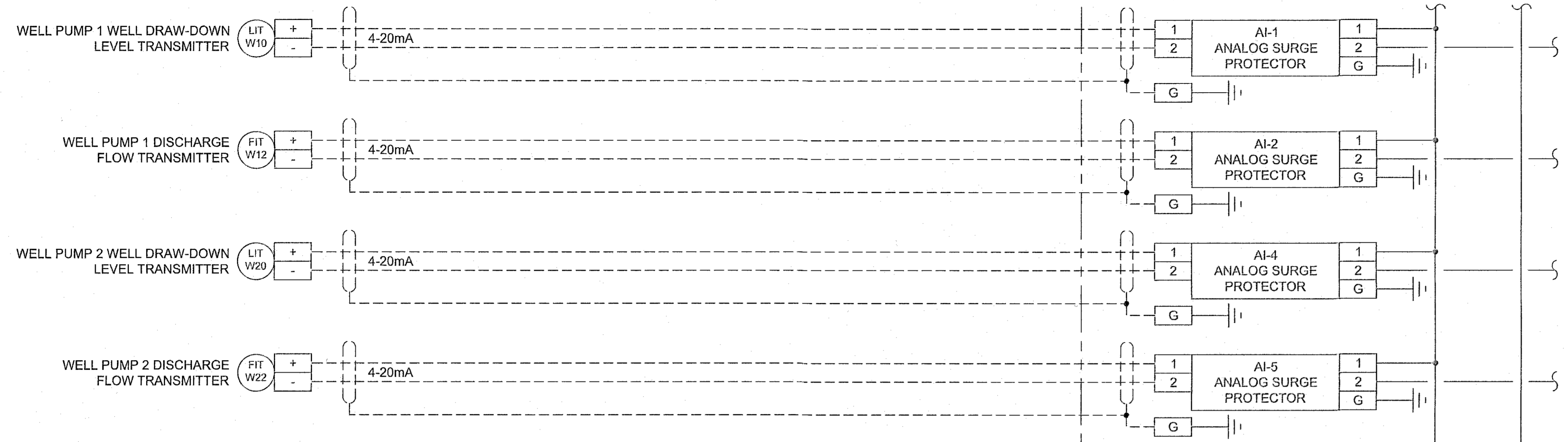
SHEET 43 OF 60 SHEETS E-132

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FIELD

SCADA RTU 82



GENERAL NOTES:

1. I/O CONNECTIONS TO SCADA RTU 82 BASED ON SHOP DRAWINGS FOR RTU PANEL. CONTRACTOR SHALL FIELD-VERIFY ALL I/O POINTS AT THE RTU AND ADJUST WORK ACCORDINGLY.
2. ONLY I/O POINTS USED UNDER THIS CONTRACT ARE SHOWN ON THESE DRAWINGS. REFER TO EXISTING RTU SHOP DRAWINGS FOR A COMPLETE LIST OF EXISTING I/O POINTS. THE CONTRACTOR MAY REQUEST AND OBTAIN THE AVAILABLE EXISTING RTU SHOP DRAWINGS FROM DOW FOR REFERENCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-VERIFYING ALL EXISTING I/O POINTS.

LEGEND

	TB#	TERMINAL BLOCK OR DEVICE TERMINAL
		FIELD WIRING

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

REVISION	DATE	BY	APPROVED

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.")

BY: *Clay K. Ozaki* 4/30/20 EXP. DATE

DEPARTMENT OF WATER
COUNTY OF KAUAI

JOB NO. WKK-03

MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2
KILAUEA, KAUA'I, HAWAII

TEMPORARY SCADA I/O WIRING DIAGRAM - 3

DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH

APPROVED BY: *For [Signature]* 3/11/19 DATE
MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI

SHEET 44 OF 60 SHEETS E-133

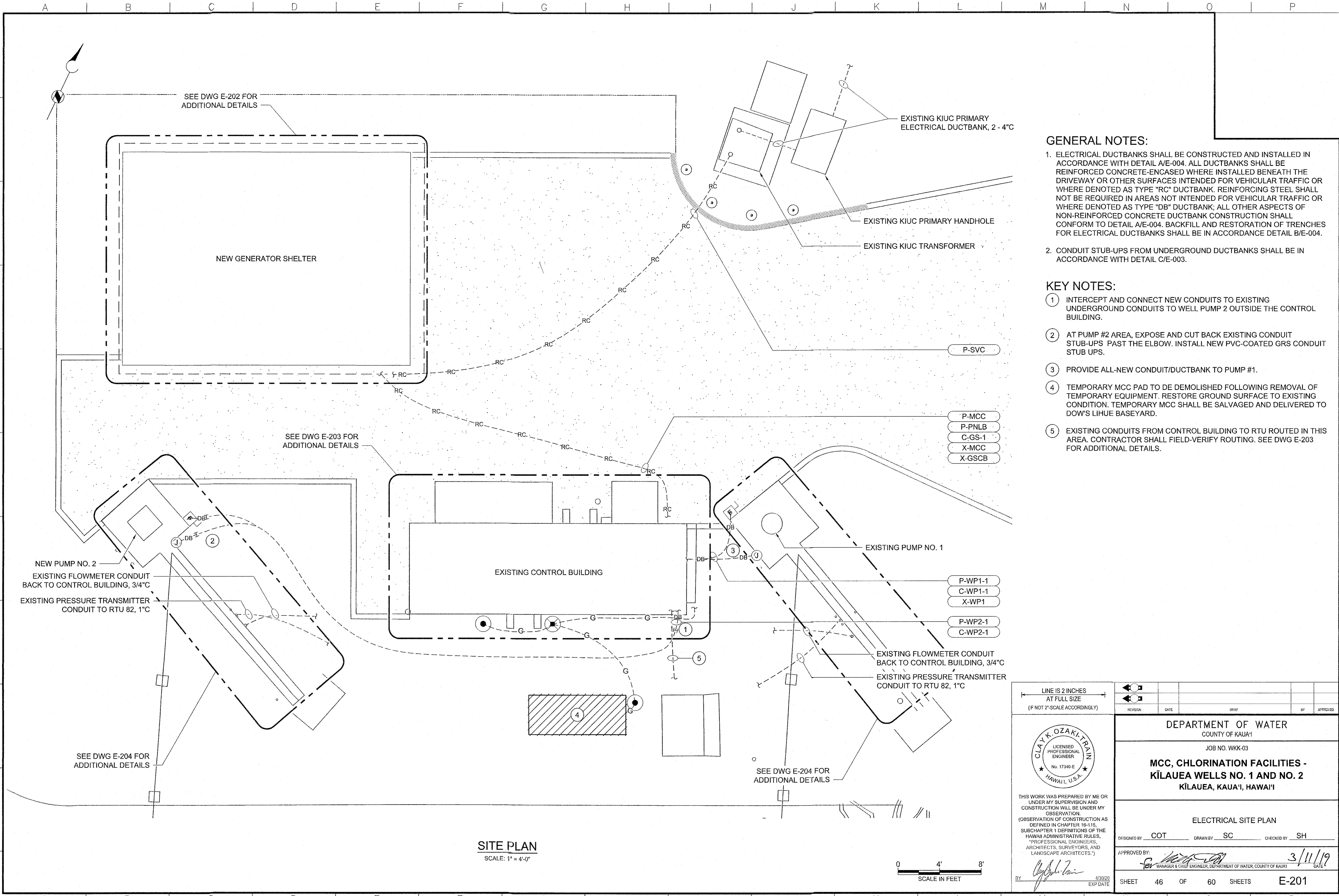
Path: P:\Projects\Kauai, County Of (H)\150756 Kilauaea Wells MCC Design\400 Design\CADD\SHEETS\ELECTRICAL File Name: 150756-E-141.dwg Plot Date: January 10, 2019 - 12:13 PM CADD User: Clay Ozaki-Train

PANEL SCHEDULE PNL-T KĪLAUEA WELLS (TEMPORARY SYSTEM)												
208 V 120 VOLTS		NORMAL POWER		BUS RATING: 100 AMPS		LOCATION: TEMP MCC		FEED-THRU LUGS		NO		
3 -PHASE		PNL MFR.:		MAIN: CB 50 AMPS		MOUNTING: INSIDE MCC		DOUBLE LUGS		NO		
4 -WIRE		CAT. NO.:		A.I.C. RATING: 18k		FED FROM: MCC VIA XFMR-T		ISOLATED GND		NO		
REF. DWG.:						CONDUCTORS:		200% NEUTRAL		NO		
CKT NO.	CIRCUIT DESCRIPTION	CODE	LOAD (kVA)	BKR AMPS	PH	BKR AMPS	LOAD (kVA)	CODE	CIRCUIT DESCRIPTION	CKT NO.		
1	PUMP 1 HEATER (SEE NOTE 1)	Z	0.50	20	-A-	40	1.43	Z	CONTROL BUILDING PNL-A (TEMPORARY)	2		
3	PUMP 2 HEATER (SEE NOTE 1)	Z	0.50	20	-B-	40	1.43			4		
5	PUMP 1 TEST	Z	1.00	20	-C-	40	1.43			6		
7	PUMP 2 TEST	Z	1.00	20	-A-	20				8		
9	RTU #2 (SEE NOTE 1)	Z	1.00	20	-B-	20				10		
11	SPARE			20	-C-	20				12		
13	SPACE				-A-					14		
15	SPACE				-B-					16		
17	SPACE				-C-					18		
CODES:		CONNECTED LOAD		CALCULATED DEMAND LOAD				NOTES:				
H = HVAC LOADS		0.00 kVA		0.00 kVA (100%)				1 EXISTING LOAD CONNECTED TO THIS PANEL.				
L = LIGHTING LOADS		0.00 kVA		0.00 kVA (125%)				2 GFCI TYPE BREAKER.				
LM = LARGEST SINGLE MOTOR		0.00 kVA		0.00 kVA (125%)				3 THE AIC RATING LISTED IS A MINIMUM ALLOWABLE. ACTUAL AIC RATING SHALL BE VERIFIED WITH THE SHORT CIRCUIT STUDY REQUIRED BY SP-34.B.				
M = OTHER MOTOR LOADS		0.00 kVA		0.00 kVA (100%)								
NC = NON-COINCIDENTAL LOADS		0.00 kVA		0.00 kVA (0%)								
R = GENERAL USE RECEPTACLES		0.00 kVA		0.00 kVA (50%>10kVA)								
S = DEDICATED RECEPTACLES		0.00 kVA		0.00 kVA (100%)								
Z = MISC. OR APPLIANCES		8.30 kVA		8.30 kVA (100%)								
TOTALS:		8.30 kVA		8.30 kVA				PHASE BALANCE ONLY				
		23 AMPS		23 AMPS				PHASE A 24 AMPS				
								PHASE B 24 AMPS				
								PHASE C 20 AMPS				

PANEL SCHEDULE PNL-A KĪLAUEA WELLS (TEMPORARY SYSTEM)											
208 V 120 VOLTS		NORMAL POWER		BUS RATING: 100 AMPS		LOCATION: INSIDE CONTROL BUILDING		FEED-THRU LUGS		NO	
3 -PHASE		PNL MFR.:		MAIN: CB 100 AMPS		MOUNTING: WALL-MOUNTED		DOUBLE LUGS		NO	
4 -WIRE		CAT. NO.:		A.I.C. RATING: 18k		FED FROM: PNL-T (TEMP MCC)		ISOLATED GND		NO	
REF. DWG.:						CONDUCTORS:		200% NEUTRAL		NO	
CKT NO.	CIRCUIT DESCRIPTION	CODE	LOAD (kVA)	BKR AMPS	PH	BKR AMPS	LOAD (kVA)	CODE	CIRCUIT DESCRIPTION	CKT NO.	
1	CONTROL BUILDING INTERIOR LIGHTS (SEE NOTE 1)	L	0.20	20	-A-	20	0.90	R	CONTROL BUILDING RECEPTACLES (SEE NOTE 1)	2	
3	FLOODLIGHT (SEE NOTE 1)	L	0.20	20	-B-	20	1.80	S	COMPRESSOR RECEPTACLE (SEE NOTE 1)	4	
5	CHLORINATION CONTROL PANEL (SEE NOTE 1)	Z	0.10	20	-C-	20	1.00	Z	RTU 59 (SEE NOTE 1)	6	
7	SPARE			20	-A-	20			SPARE	8	
9	SPARE			20	-B-	20			SPARE	10	
11	SPARE			20	-C-	20			SPARE	12	
13	SPARE			20	-A-	20			SPARE	14	
15	SPARE			20	-B-	20			SPARE	16	
17	SPARE			50	-C-	20			SPARE	18	
19	SPARE			20	-A-	20			SPARE	20	
21	SPARE			20	-B-	20			SPARE	22	
23	SPARE			20	-C-	20			SPARE	24	
25	SPACE			20	-A-	20			SPACE	26	
27	SPACE			20	-B-	20			SPACE	28	
29	SPACE			20	-C-	20			SPACE	30	
CODES:		CONNECTED LOAD		CALCULATED DEMAND LOAD				NOTES:			
H = HVAC LOADS		0.00 kVA		0.00 kVA (100%)				1 EXISTING LOAD CONNECTED TO THIS PANEL.			
L = LIGHTING LOADS		0.40 kVA		0.50 kVA (125%)				2 GFCI TYPE BREAKER.			
LM = LARGEST SINGLE MOTOR		0.00 kVA		0.00 kVA (125%)				3 THE AIC RATING LISTED IS A MINIMUM ALLOWABLE. ACTUAL AIC RATING SHALL BE VERIFIED WITH THE SHORT CIRCUIT STUDY REQUIRED BY SP-34.B.			
M = OTHER MOTOR LOADS		0.00 kVA		0.00 kVA (100%)							
NC = NON-COINCIDENTAL LOADS		0.00 kVA		0.00 kVA (0%)							
R = GENERAL USE RECEPTACLES		2.70 kVA		2.70 kVA (50%>10kVA)							
S = DEDICATED RECEPTACLES		0.00 kVA		0.00 kVA (100%)							
Z = MISC. OR APPLIANCES		1.10 kVA		1.10 kVA (100%)							
TOTALS:		4.20 kVA		4.30 kVA				PHASE BALANCE ONLY			
		12 AMPS		12 AMPS				PHASE A 9 AMPS			
								PHASE B 17 AMPS			
								PHASE C 9 AMPS			

<p>LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)</p>			<table border="1"> <tr> <th>REVISION</th> <th>DATE</th> <th>BY</th> <th>APPROVED</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>		REVISION	DATE	BY	APPROVED				
	REVISION	DATE	BY	APPROVED								
	<p>DEPARTMENT OF WATER COUNTY OF KAUAI</p> <p>JOB NO. WKK-03</p> <p>MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2 KĪLAUEA, KAUA'I, HAWAII</p>											
<p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.")</p>	<p>TEMPORARY ELECTRICAL SCHEDULES</p> <p>DESIGNED BY <u>COT</u> DRAWN BY <u>SC</u> CHECKED BY <u>SH</u></p> <p>APPROVED BY: DATE <u>3/11/19</u></p> <p>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</p>											
<p>BY 4/30/20 EXP DATE</p>	<p>SHEET 45 OF 60 SHEETS E-141</p>											

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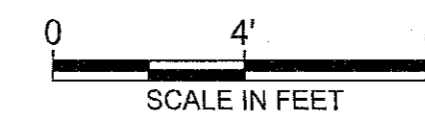
GENERAL NOTES:

1. ELECTRICAL DUCTBANKS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH DETAIL A/E-004. ALL DUCTBANKS SHALL BE REINFORCED CONCRETE-ENCASED WHERE INSTALLED BENEATH THE DRIVEWAY OR OTHER SURFACES INTENDED FOR VEHICULAR TRAFFIC OR WHERE DENOTED AS TYPE "RC" DUCTBANK. REINFORCING STEEL SHALL NOT BE REQUIRED IN AREAS NOT INTENDED FOR VEHICULAR TRAFFIC OR WHERE DENOTED AS TYPE "DB" DUCTBANK; ALL OTHER ASPECTS OF NON-REINFORCED CONCRETE DUCTBANK CONSTRUCTION SHALL CONFORM TO DETAIL A/E-004. BACKFILL AND RESTORATION OF TRENCHES FOR ELECTRICAL DUCTBANKS SHALL BE IN ACCORDANCE DETAIL B/E-004.
2. CONDUIT STUB-UPS FROM UNDERGROUND DUCTBANKS SHALL BE IN ACCORDANCE WITH DETAIL C/E-003.

KEY NOTES:

- 1 INTERCEPT AND CONNECT NEW CONDUITS TO EXISTING UNDERGROUND CONDUITS TO WELL PUMP 2 OUTSIDE THE CONTROL BUILDING.
- 2 AT PUMP #2 AREA, EXPOSE AND CUT BACK EXISTING CONDUIT STUB-UPS PAST THE ELBOW. INSTALL NEW PVC-COATED GRS CONDUIT STUB UPS.
- 3 PROVIDE ALL-NEW CONDUIT/DUCTBANK TO PUMP #1.
- 4 TEMPORARY MCC PAD TO BE DEMOLISHED FOLLOWING REMOVAL OF TEMPORARY EQUIPMENT. RESTORE GROUND SURFACE TO EXISTING CONDITION. TEMPORARY MCC SHALL BE SALVAGED AND DELIVERED TO DOW'S LIHUE BASEYARD.
- 5 EXISTING CONDUITS FROM CONTROL BUILDING TO RTU Routed IN THIS AREA. CONTRACTOR SHALL FIELD-VERIFY ROUTING. SEE DWG E-203 FOR ADDITIONAL DETAILS.

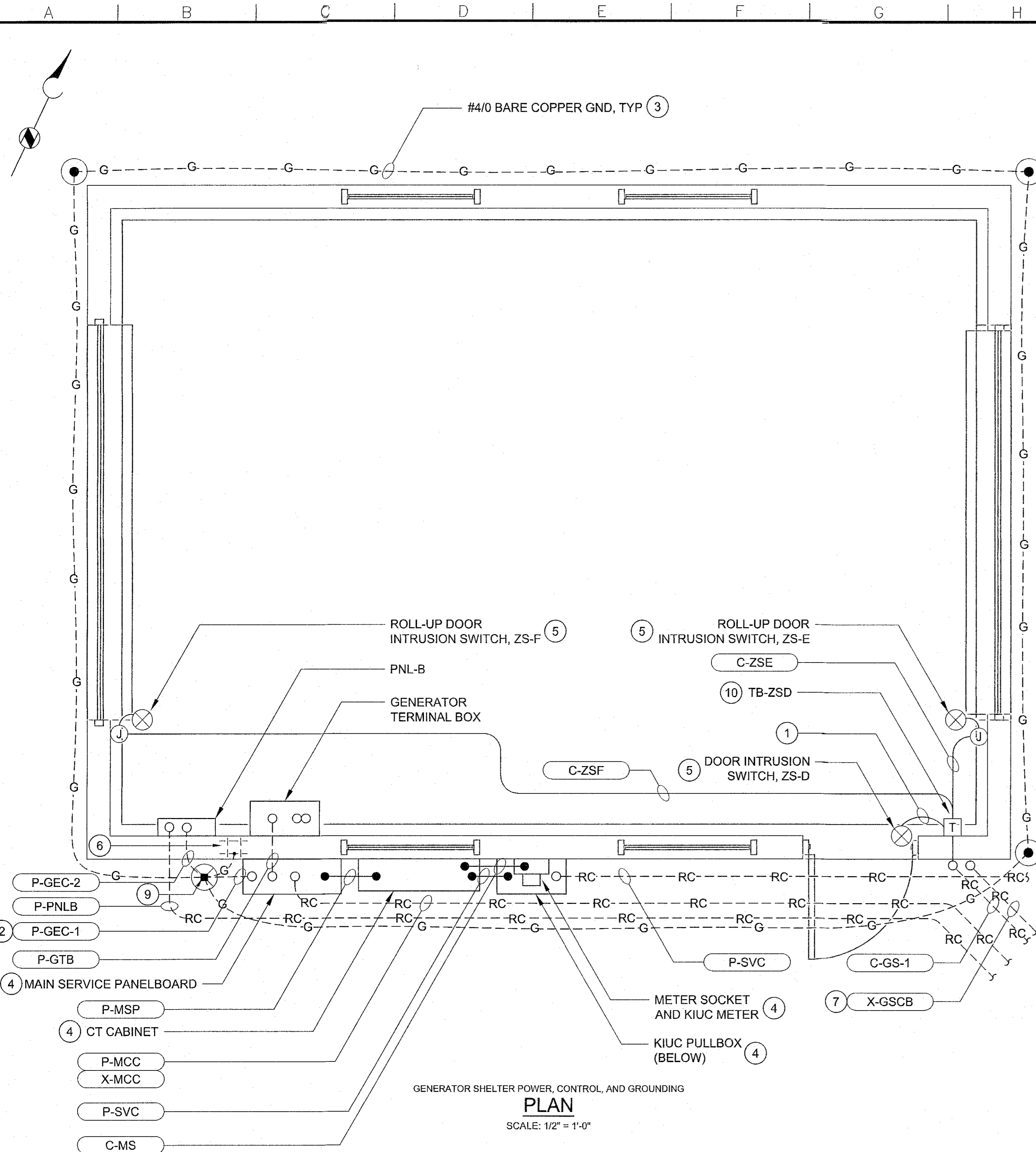
SITE PLAN
SCALE: 1" = 4'-0"



	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2'-SCALE ACCORDINGLY)			
	REVISION DATE SHEET	BY APPROVED	DATE SHEET	BY APPROVED
DEPARTMENT OF WATER COUNTY OF KAUAI				
JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2 KĪLAUEA, KAUAI, HAWAII				
ELECTRICAL SITE PLAN				
DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH				
APPROVED BY: DATE: 3/11/19 <small>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</small>				
SHEET 46 OF 60 SHEETS E-201				

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION.
(OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, *PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.*)

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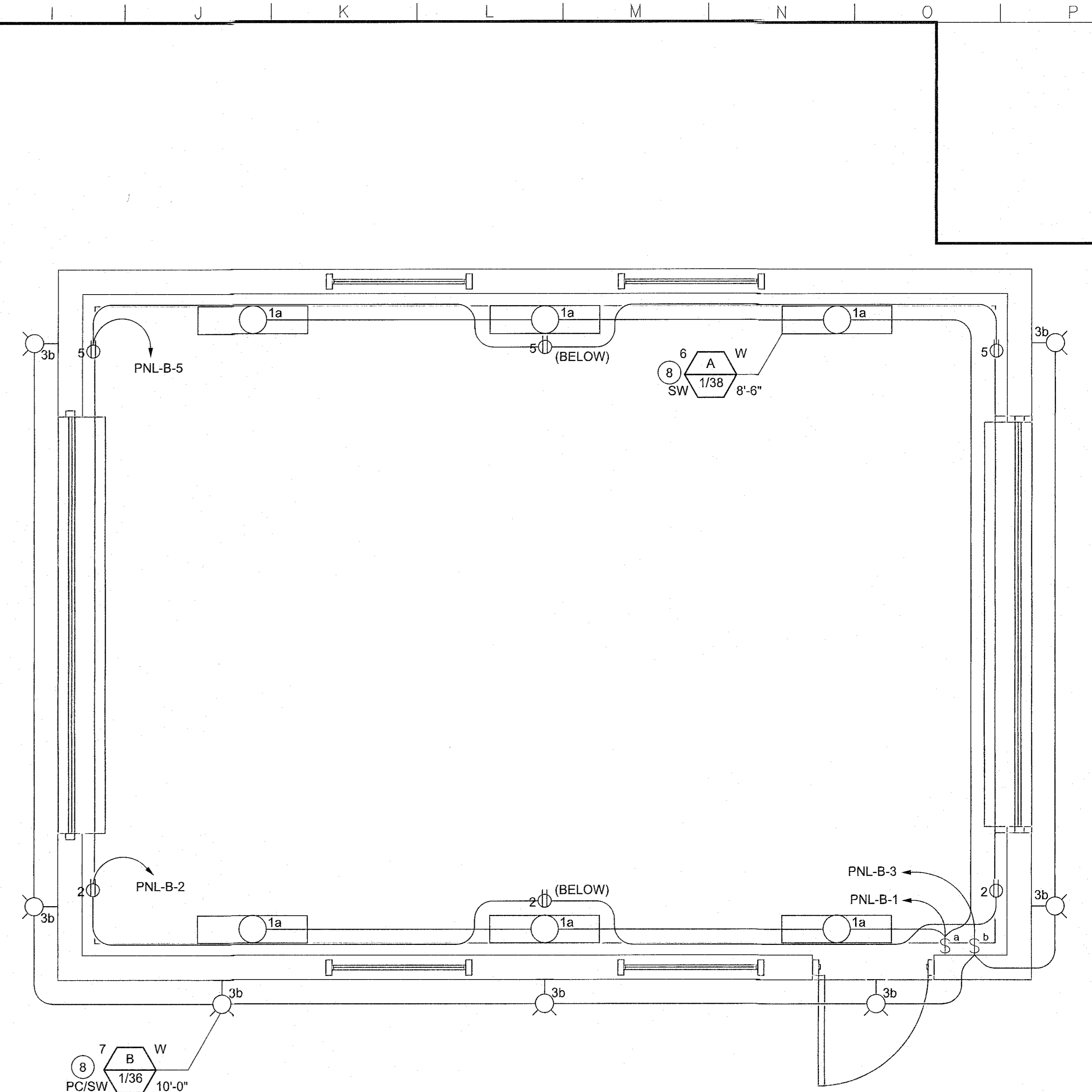
GENERATOR SHELTER POWER, CONTROL, AND GROUNDING
PLAN
 SCALE: 1/2" = 1'-0"

GENERAL NOTES:

1. WHERE POSSIBLE, CONDUIT SHALL BE INSTALLED CONCEALED IN WALLS OR FLOOR SLAB UNLESS OTHERWISE NOTED.
2. ALL LIGHTING AND RECEPTACLE CIRCUITS FOR THE GENERATOR SHELTER ARE FED FROM PNL-B.
3. WIRING FOR ALL LIGHTING AND RECEPTACLE CIRCUITS FOR THE GENERATOR SHELTER SHALL BE 2-#12, 1#12 GND IN 3/4" GRS CONDUIT UNLESS OTHERWISE NOTED.
4. ALL EXTERIOR LIGHT FIXTURES SHALL BE DOWNWARD-FACING, FULL-CUTOFF TYPE, AND COMPLY WITH SHEARWATER PROTECTION REQUIREMENTS.
5. ELECTRICAL DUCTBANKS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH DETAIL A/E-004. SEE GENERAL NOTE 1 ON DWG E-201.
6. ALL CONDUIT STUB-UPS SHALL BE IN ACCORDANCE WITH DETAIL C/E-003.

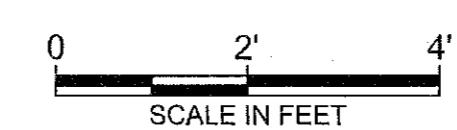
KEY NOTES:

1. DOOR INTRUSION SWITCH MANUFACTURER STAINLESS STEEL ARMORED CABLE PROVIDED WITH SWITCH CONTACT ASSEMBLY. ROUTE ARMORED CABLE TO JUNCTION/TERMINAL BOX OUTSIDE TRAFFICKED AREA AND SECURE TO WALL OR FLOOR. PROVIDE GLAND FITTING FOR ARMORED CABLE AT JUNCTION/TERMINAL BOX. TYPICAL FOR ALL INTRUSION SWITCHES.
2. ROUTE SCHEDULE 80 PVC CONDUIT WITH #4/0 BC GROUNDING ELECTRODE CONDUCTOR FROM PANELBOARD TO GROUND ROD TEST WELL BELOW GRADE AND STUB INTO TEST WELL. BOND GROUNDING ELECTRODE CONDUCTOR TO GROUND ROD USING EXOTHERMIC WELD OR IRREVERSIBLE COMPRESSION CONNECTOR.
3. INSTALL GROUNDING CONDUCTOR MINIMUM 30" BELOW GRADE AND BOND TO GROUND ROD AT EACH END USING EXOTHERMIC WELD OR IRREVERSIBLE COMPRESSION CONNECTOR.
4. SEE DWG E-222 FOR ELECTRICAL SERVICE EQUIPMENT ELEVATION.
5. INSTALL DOOR SECURITY SWITCH IN ACCORDANCE WITH MANUFACTURER INSTRUCTIONS.



GENERATOR SHELTER LIGHTING AND RECEPTACLE
PLAN
 SCALE: 1/2" = 1'-0"

6. BOND GROUND ROD TO BUILDING REINFORCING STEEL VIA EXOTHERMIC WELD. COORDINATE INSTALLATION OF #4/0 BARE COPPER GROUNDING CONDUCTOR WITH STRUCTURAL.
7. STUB-UP SPARE CONDUITS 6" ABOVE CURB AT EXTERIOR WALL OF THE GENERATOR SHELTER PER DETAIL C/E-003. PROVIDE THREADED CONDUIT PLUG/CAP FOR EACH SPARE CONDUIT.
8. SEE LUMINAIRE SCHEDULE ON DWG E-241.
9. INSTALL GROUND ROD AND TEST WELL PER DETAIL D/E-004.
10. PROVIDE TERMINAL BOX, MINIMUM SIZE 12"x12"x8", WITH DOOR SWITCH ZS-D TO ALLOW TERMINATION OF WIRING FOR GENERATOR SHELTER DOOR SWITCHES. DOOR SWITCHES SHALL BE WIRED IN SERIES AND WIRING SHALL TERMINATE ON TERMINAL BLOCKS.



LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)	REVISION DATE BY APPROVED	DEPARTMENT OF WATER COUNTY OF KAUAI JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII GENERATOR SHELTER PLANS DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH APPROVED BY: <i>[Signature]</i> DATE: 3/11/19 MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI
	THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.) BY: <i>[Signature]</i> 4/30/20 EXP. DATE	
SHEET 47 OF 60 SHEETS E-202		

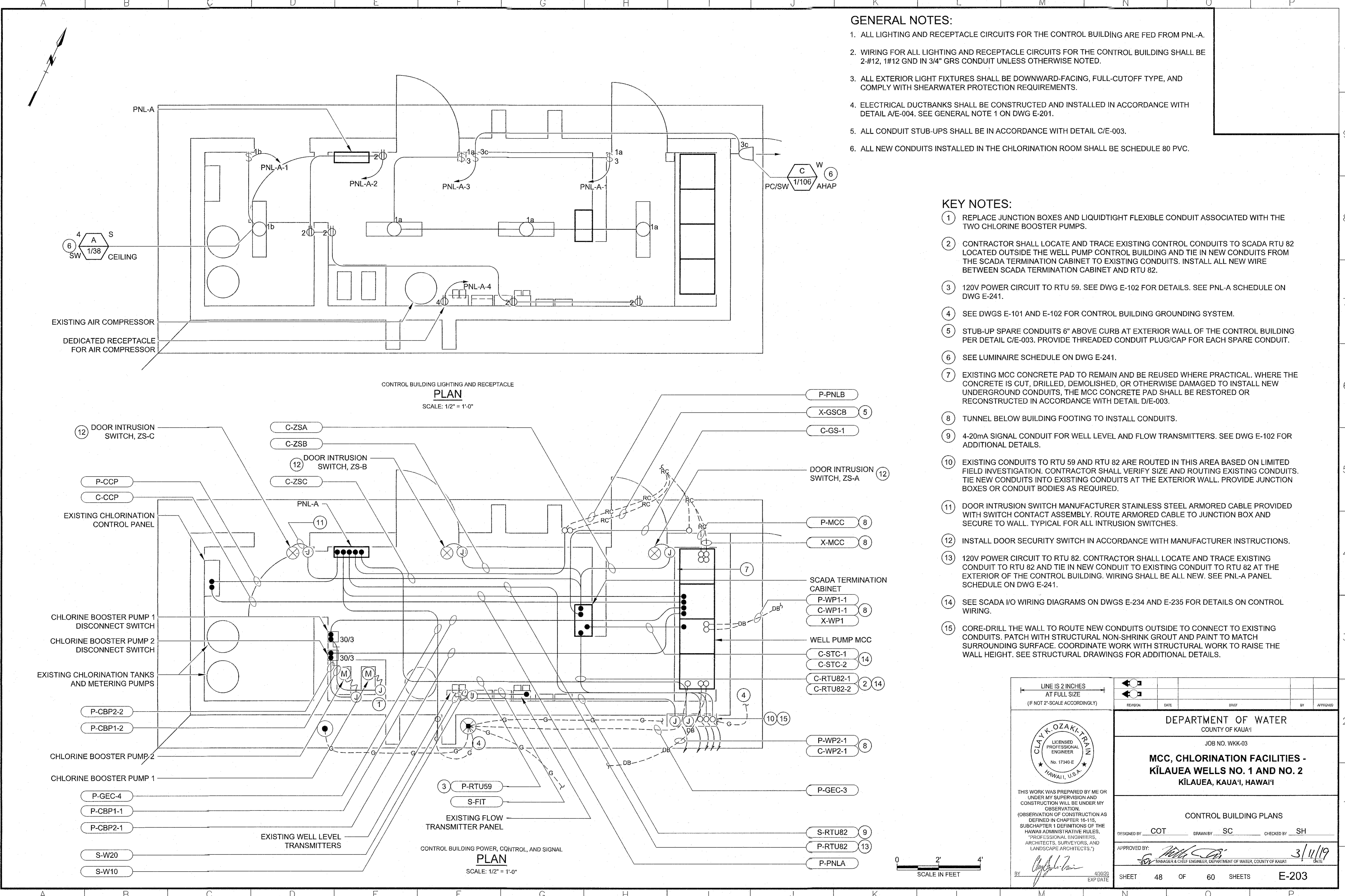
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GENERAL NOTES:

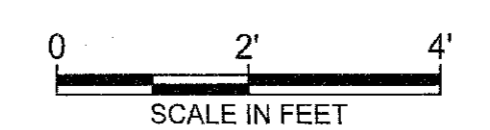
1. ALL LIGHTING AND RECEPTACLE CIRCUITS FOR THE CONTROL BUILDING ARE FED FROM PNL-A.
2. WIRING FOR ALL LIGHTING AND RECEPTACLE CIRCUITS FOR THE CONTROL BUILDING SHALL BE 2-#12, 1#12 GND IN 3/4" GRS CONDUIT UNLESS OTHERWISE NOTED.
3. ALL EXTERIOR LIGHT FIXTURES SHALL BE DOWNWARD-FACING, FULL-CUTOFF TYPE, AND COMPLY WITH SHEARWATER PROTECTION REQUIREMENTS.
4. ELECTRICAL DUCTBANKS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH DETAIL A/E-004. SEE GENERAL NOTE 1 ON DWG E-201.
5. ALL CONDUIT STUB-UPS SHALL BE IN ACCORDANCE WITH DETAIL C/E-003.
6. ALL NEW CONDUITS INSTALLED IN THE CHLORINATION ROOM SHALL BE SCHEDULE 80 PVC.

KEY NOTES:

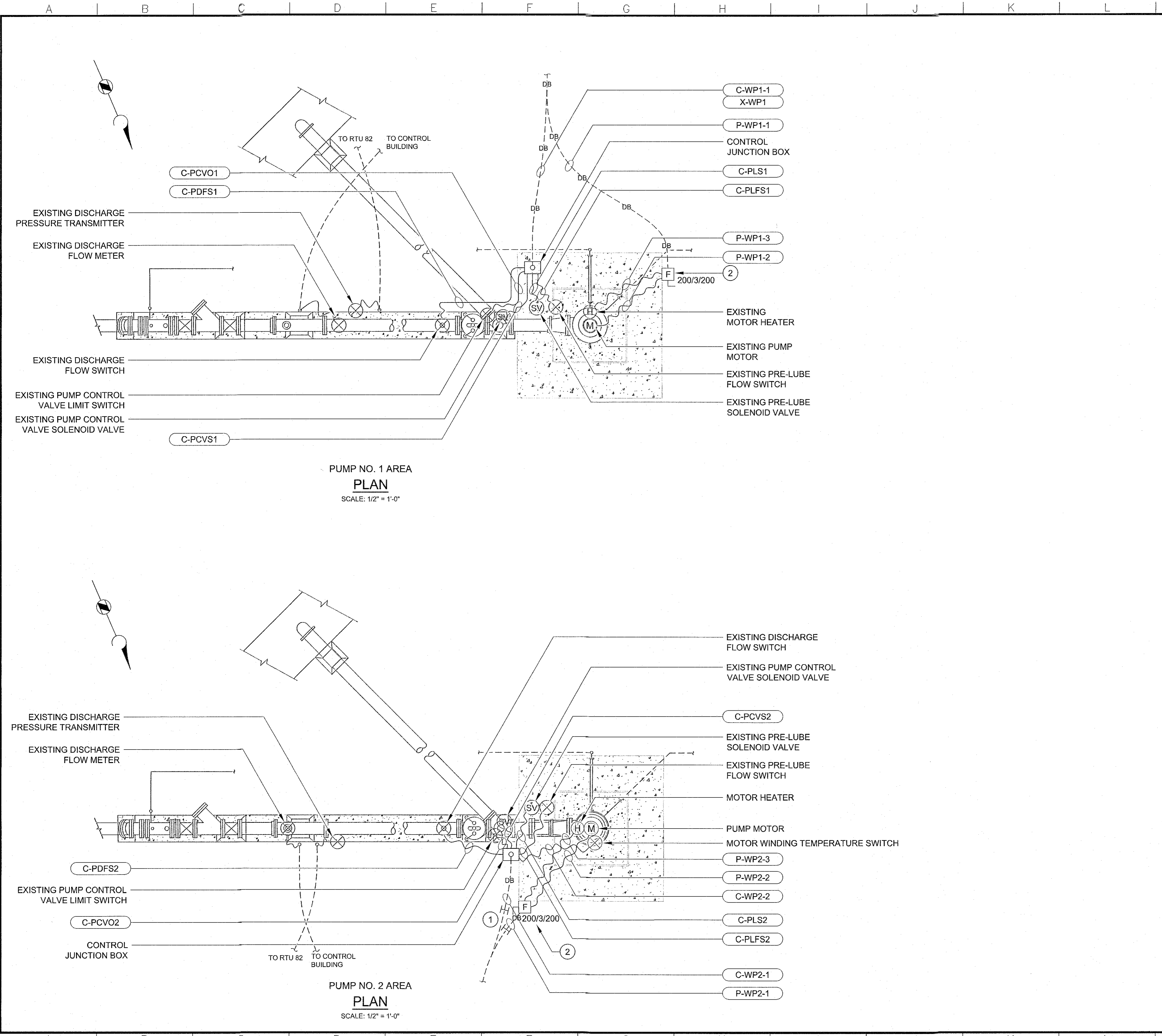
- 1 REPLACE JUNCTION BOXES AND LIQUIDTIGHT FLEXIBLE CONDUIT ASSOCIATED WITH THE TWO CHLORINE BOOSTER PUMPS.
- 2 CONTRACTOR SHALL LOCATE AND TRACE EXISTING CONTROL CONDUITS TO SCADA RTU 82 LOCATED OUTSIDE THE WELL PUMP CONTROL BUILDING AND TIE IN NEW CONDUITS FROM THE SCADA TERMINATION CABINET TO EXISTING CONDUITS. INSTALL ALL NEW WIRE BETWEEN SCADA TERMINATION CABINET AND RTU 82.
- 3 120V POWER CIRCUIT TO RTU 59. SEE DWG E-102 FOR DETAILS. SEE PNL-A SCHEDULE ON DWG E-241.
- 4 SEE DWGS E-101 AND E-102 FOR CONTROL BUILDING GROUNDING SYSTEM.
- 5 STUB-UP SPARE CONDUITS 6" ABOVE CURB AT EXTERIOR WALL OF THE CONTROL BUILDING PER DETAIL C/E-003. PROVIDE THREADED CONDUIT PLUG/CAP FOR EACH SPARE CONDUIT.
- 6 SEE LUMINAIRE SCHEDULE ON DWG E-241.
- 7 EXISTING MCC CONCRETE PAD TO REMAIN AND BE REUSED WHERE PRACTICAL. WHERE THE CONCRETE IS CUT, DRILLED, DEMOLISHED, OR OTHERWISE DAMAGED TO INSTALL NEW UNDERGROUND CONDUITS, THE MCC CONCRETE PAD SHALL BE RESTORED OR RECONSTRUCTED IN ACCORDANCE WITH DETAIL D/E-003.
- 8 TUNNEL BELOW BUILDING FOOTING TO INSTALL CONDUITS.
- 9 4-20mA SIGNAL CONDUIT FOR WELL LEVEL AND FLOW TRANSMITTERS. SEE DWG E-102 FOR ADDITIONAL DETAILS.
- 10 EXISTING CONDUITS TO RTU 59 AND RTU 82 ARE ROUTED IN THIS AREA BASED ON LIMITED FIELD INVESTIGATION. CONTRACTOR SHALL VERIFY SIZE AND ROUTING EXISTING CONDUITS. TIE NEW CONDUITS INTO EXISTING CONDUITS AT THE EXTERIOR WALL. PROVIDE JUNCTION BOXES OR CONDUIT BODIES AS REQUIRED.
- 11 DOOR INTRUSION SWITCH MANUFACTURER STAINLESS STEEL ARMORED CABLE PROVIDED WITH SWITCH CONTACT ASSEMBLY. ROUTE ARMORED CABLE TO JUNCTION BOX AND SECURE TO WALL. TYPICAL FOR ALL INTRUSION SWITCHES.
- 12 INSTALL DOOR SECURITY SWITCH IN ACCORDANCE WITH MANUFACTURER INSTRUCTIONS.
- 13 120V POWER CIRCUIT TO RTU 82. CONTRACTOR SHALL LOCATE AND TRACE EXISTING CONDUIT TO RTU 82 AND TIE IN NEW CONDUIT TO EXISTING CONDUIT TO RTU 82 AT THE EXTERIOR OF THE CONTROL BUILDING. WIRING SHALL BE ALL NEW. SEE PNL-A PANEL SCHEDULE ON DWG E-241.
- 14 SEE SCADA I/O WIRING DIAGRAMS ON DWGS E-234 AND E-235 FOR DETAILS ON CONTROL WIRING.
- 15 CORE-DRILL THE WALL TO ROUTE NEW CONDUITS OUTSIDE TO CONNECT TO EXISTING CONDUITS. PATCH WITH STRUCTURAL NON-SHRINK GROUT AND PAINT TO MATCH SURROUNDING SURFACE. COORDINATE WORK WITH STRUCTURAL WORK TO RAISE THE WALL HEIGHT. SEE STRUCTURAL DRAWINGS FOR ADDITIONAL DETAILS.



	DEPARTMENT OF WATER COUNTY OF KAUAI JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII			
	CONTROL BUILDING PLANS			
	DESIGNED BY:	COT	DRAWN BY:	SC
	CHECKED BY:	SH	DATE:	3/11/19
APPROVED BY: <small>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</small>		SHEET 48 OF 60 SHEETS E-203		



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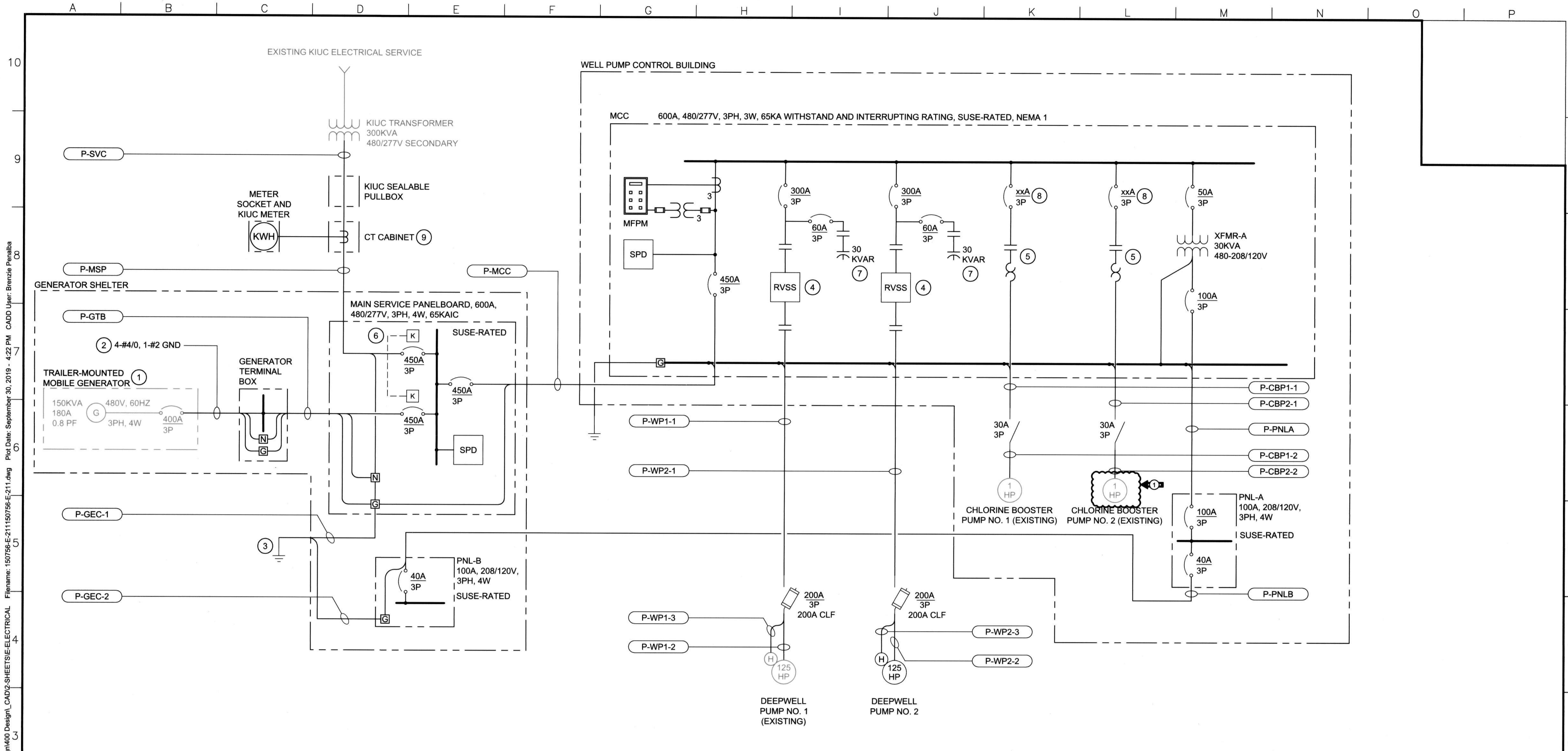


PUMP NO. 1 AREA PLAN
SCALE: 1/2" = 1'-0"

PUMP NO. 2 AREA PLAN
SCALE: 1/2" = 1'-0"

- GENERAL NOTES:**
1. ALL WIRING, CONDUIT, AND JUNCTION BOXES FOR PUMP CONTROL INSTRUMENTS AT THE PUMP AREAS SHALL BE ALL NEW.
 2. UNSUPPORTED LENGTHS OF LIQUIDTIGHT FLEXIBLE METAL CONDUIT SHALL BE LIMITED TO 36". FLEXIBLE CONDUIT SHALL NOT HANG DOWN TO GROUND SURFACE. SUPPORT FLEX CONDUITS PER DETAIL B/E-005.
 4. ELECTRICAL DUCTBANKS SHALL BE CONSTRUCTED AND INSTALLED IN ACCORDANCE WITH DETAIL A/E-004. SEE GENERAL NOTE 1 ON DWG E-201.
 5. ALL CONDUIT STUB-UPS SHALL BE IN ACCORDANCE WITH DETAIL C/E-003.
- KEY NOTES:**
- 1 CUT BACK EXISTING CONDUIT STUB-UPS PAST THE UNDERGROUND ELBOW. INSTALL NEW CONDUIT STUB-UPS USING PVC-COATED GRS CONDUIT.
 - 2 PROVIDE EQUIPMENT RACK FOR MOUNTING DISCONNECT SWITCH IN ACCORDANCE WITH DETAIL B/E-003.

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)	REVISION DATE SHEET BY APPROVED
	DEPARTMENT OF WATER COUNTY OF KAUAI JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII
CLAY K. OZAKI-TRAM LICENSED PROFESSIONAL ENGINEER No. 17340-E HAWAII, U.S.A.	PUMP AREA PLANS DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.")	APPROVED BY: <i>[Signature]</i> DATE: 3/11/19 MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI
BY: <i>[Signature]</i> 4/30/20 EXP DATE	SHEET 49 OF 60 SHEETS E-204



ONE-LINE DIAGRAM

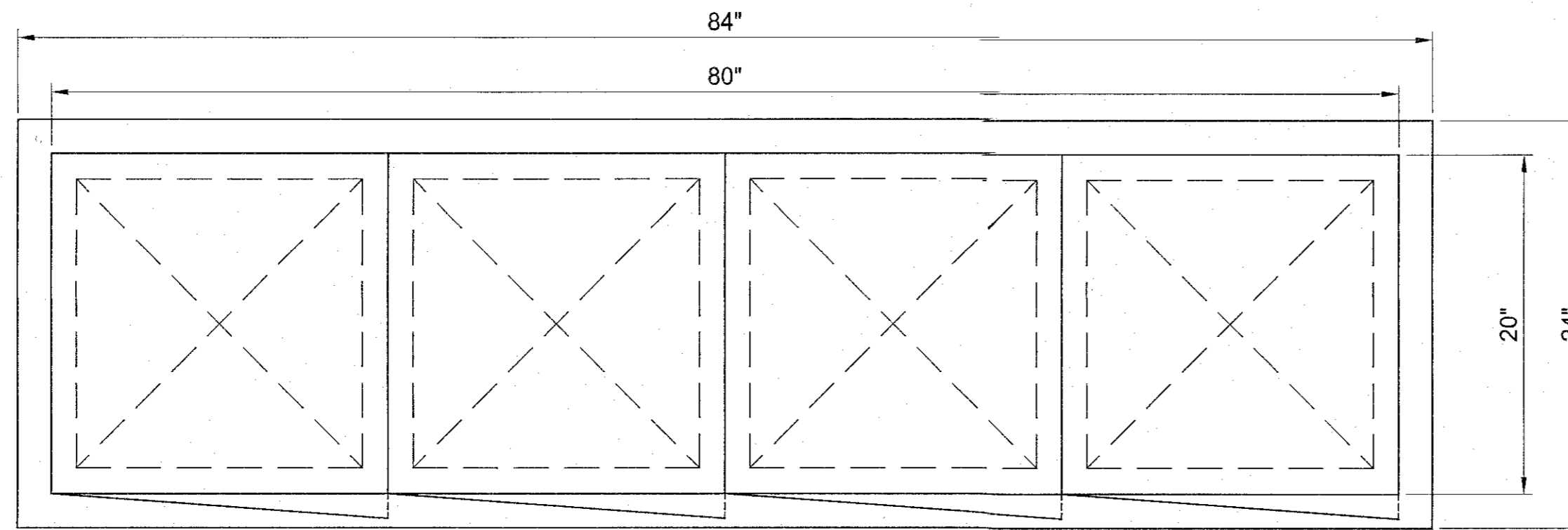
KEY NOTES:

- ① TRAILER-MOUNTED MOBILE GENERATOR PROVIDED BY DOW.
- ② PROVIDE TYPE W PORTABLE POWER CABLE PER NEC ARTICLE 400 FOR MOBILE GENERATOR OUTPUT CABLES. FLEXIBLE POWER CORD SHALL NOT BE INSTALLED IN CONDUIT. MINIMUM CABLE LENGTH SHALL BE 20 FT PER PHASE, NEUTRAL, AND GROUND.
- ③ REFER TO DRAWING E-202 FOR GENERATOR SHELTER GROUNDING ELECTRODE SYSTEM.
- ④ PROVIDE WELL PUMP MOTOR CONTROLS PER DWGS E-231 AND E-232.
- ⑤ PROVIDE CHLORINE BOOSTER PUMP MOTOR CONTROLS PER DWG E-233.
- ⑥ PROVIDE KEY INTERLOCK FOR UTILITY AND GENERATOR CIRCUIT BREAKERS TO INHIBIT SIMULTANEOUS CONNECTION OF SOURCES.
- ⑦ RATING OF POWER FACTOR CORRECTION CAPACITORS IS APPROXIMATE. CONTRACTOR SHALL SELECT RATING OF POWER FACTOR CORRECTION CAPACITORS ACCORDING TO THE ACTUAL MOTOR INSTALLED. REFER TO SP-8.6 FOR ADDITIONAL REQUIREMENTS.
- ⑧ MCP RATING SELECTED BY MANUFACTURER BASED ON CONNECTED MOTOR LOAD.
- ⑨ CT'S SUPPLIED BY KIUC.

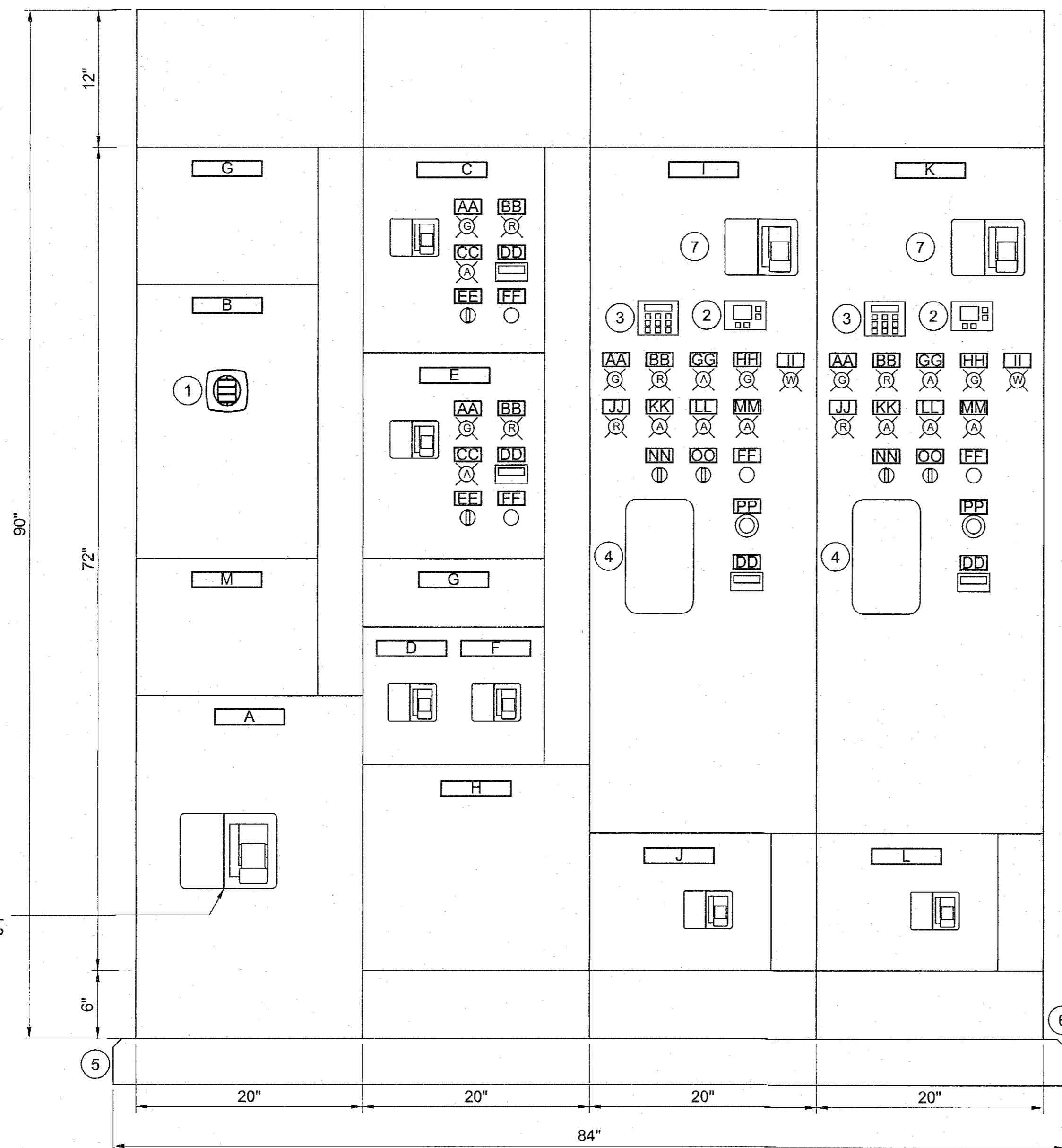
<p>LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)</p>		<p>REVISION 1</p>	<p>DATE 9/27/19</p>	<p>DOW OPS COMMENTS</p>	<p>COT</p>	<p>BY</p>	<p>APPROVED</p>
<p>DEPARTMENT OF WATER COUNTY OF KAUAI</p>							
<p>JOB NO. WKK-03</p>							
<p>MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII</p>							
<p>ONE-LINE DIAGRAM</p>							
<p>DESIGNED BY COT</p>		<p>DRAWN BY SC</p>		<p>CHECKED BY SH</p>		<p>APPROVED BY: <i>[Signature]</i></p>	
<p>BY: <i>[Signature]</i></p>		<p>DATE 10/22/19</p>		<p>MANAGER / CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</p>		<p>DATE 10/22/19</p>	
<p>4/30/20 EXP DATE</p>		<p>KAUAI ISLAND UTILITY COOPERATIVE (KIUC) APPROVAL SIGNATURE</p>		<p>DATE 10/22/19</p>		<p>SHEET 50 OF 60 SHEETS E-211</p>	

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FRONT
MCC PLAN VIEW
NO SCALE



MCC ELEVATION
NO SCALE

GENERAL NOTES:

- CONTRACTOR SHALL ENSURE THAT THE INSTALLED HEIGHT OF ANY CIRCUIT BREAKER OPERATING HANDLE DOES NOT EXCEED 6'-7" IN THE HIGHEST POSITION.

KEY NOTES:

- MULTI-FUNCTION POWER MONITOR.
- RVSS EXTERNAL DISPLAY AND CONTROL MODULE.
- MOTOR PROTECTION RELAY REMOTE OPERATOR INTERFACE.
- MECHANICAL TIMECLOCK FOR OPERATING WELL PUMP IN TIMER MODE. MOUNT TO FACE OF PUMP STARTER CABINET.
- 4" HIGH CONCRETE EQUIPMENT PAD RESTORED OR RECONSTRUCTED IN ACCORDANCE WITH DETAIL D/E-003. SEE KEY NOTE 7 ON DWG E-203.
- ANCHOR MCC PER DETAIL E/E-003.
- PROVIDE LABEL WARNING OF MULTIPLE SOURCES OF POWER/VOLTAGE WITHIN CUBICLE. LABEL SHALL NOTE WHICH EXTERNAL CIRCUITS PROVIDE POWER TO THE CUBICLE.

NAMEPLATES

ITEM	DESCRIPTION
A	MAIN BREAKER
B	POWER MONITOR
C	CHLORINE BOOSTER PUMP 1
D	TRANSFORMER-A CIRCUIT BREAKER
E	CHLORINE BOOSTER PUMP 2
F	PNL-A CIRCUIT BREAKER
G	SPACE
H	TRANSFORMER-A, 30 KVA, 480V-208/120V
I	WELL PUMP 1
J	WELL PUMP 1 CAPACITORS
K	WELL PUMP 2
L	WELL PUMP 2 CAPACITORS
M	SURGE PROTECTIVE DEVICE

ABOVE NAMEPLATES TO BE 9" X 2-1/4" X 1/8" BLACK WITH 5/8" WHITE LETTERING & BEVELED EDGES

NAMEPLATES

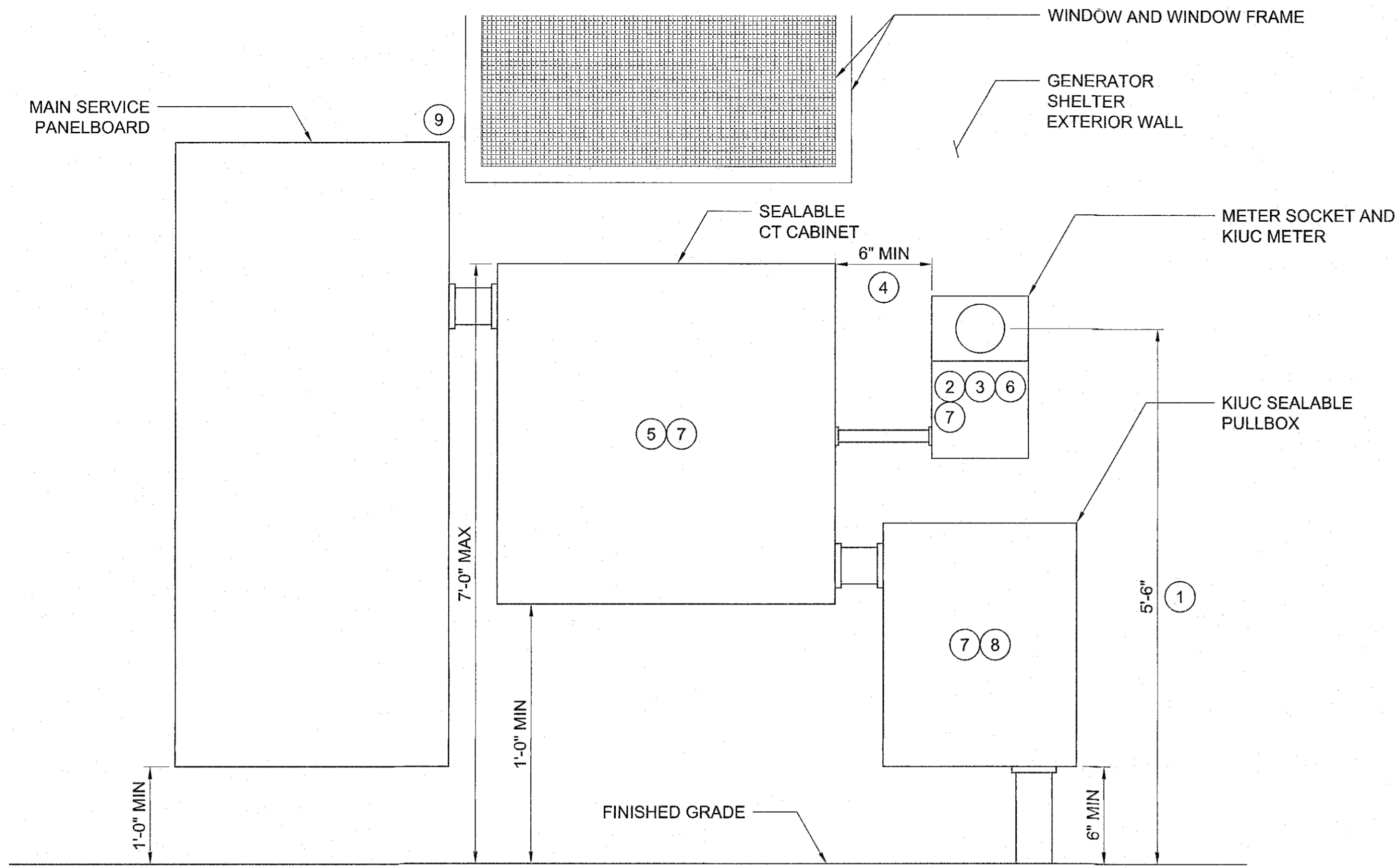
ITEM	DESCRIPTION
AA	MOTOR STOPPED
BB	MOTOR RUNNING
CC	OVERLOAD
DD	ELAPSED RUN TIME
EE	HAND - OFF - AUTO
FF	RESET
GG	TROUBLE
HH	READY
II	ON SUPERVISORY
JJ	PUMP DISCHARGE FLOW
KK	NO DISCHARGE FLOW
LL	NO PRE-LUBE FLOW
MM	HIGH DISCHARGE PRESSURE
NN	HAND - OFF - AUTO - TIMER
OO	NORMAL - TEST
PP	ESTOP

ABOVE NAMEPLATES TO BE 4" X 2" X 1/8" BLACK WITH 1/4" WHITE LETTERING & BEVELED EDGES

CIRCUIT BREAKER EXTERNAL OPERATING HANDLE, TYP

<p>LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)</p> <p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.)</p> <p>BY: <i>Clay K. Ozaki</i> 4/30/20 EXP DATE</p>	<p>REVISION DATE BRIF BY APPROVED</p>
	<p>DEPARTMENT OF WATER COUNTY OF KAUAI</p> <p>JOB NO. WKK-03</p> <p>MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2 KĪLAUEA, KAUAI, HAWAII</p> <p>MCC ELEVATION</p> <p>DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH</p> <p>APPROVED BY: <i>Scott C. O'Neil</i> 3/11/19 DATE</p> <p>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</p>
<p>SHEET 51 OF 60 SHEETS E-221</p>	

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**KIUC METER
ELEVATION DETAIL**
 NO SCALE

KEY NOTES:

- ① MOUNT METER SOCKET AT 5'-6" FROM FINISHED GRADE TO CENTERLINE OF METER.
- ② MAINTAIN MINIMUM CLEARANCE OF 5'-0" TO ANY FLAMMABLE MATERIAL.
- ③ MAINTAIN MINIMUM 4'-0" CLEAR RADIUS FREE OF ANY OBSTRUCTIONS IN FRONT OF METER SOCKET.
- ④ MAINTAIN MINIMUM 6" CLEARANCE TO ADJACENT EQUIPMENT ON ALL SIDES OF METER SOCKET.
- ⑤ CT CABINET SHALL BE 42"W X 42"H X 11"D MINIMUM DIMENSIONS, TYPE 316 STAINLESS STEEL, NEMA 3R RATED. CT CABINET SHALL INCLUDE SUITABLE MOUNTING RACKS FOR KIUC INSTRUMENT TRANSFORMERS; CONFIRM REQUIREMENTS WITH KIUC PRIOR TO ORDERING EQUIPMENT.
- ⑥ METER SOCKET SHALL BE TYPE 316 STAINLESS STEEL, NEMA 3R RATED, 13-JAW, SUITABLE FOR METERING 480/277V, 3-PHASE, 4-WIRE SERVICE. CONFIRM ALL DETAILED EQUIPMENT SPECIFICATIONS AND REQUIREMENTS WITH KIUC PRIOR TO ORDERING.
- ⑦ REFER TO KIUC SERVICE INSTALLATION MANUAL (CURRENT EDITION) FOR COMPLETE DETAILS OF METERING EQUIPMENT. INSTALLATION SHALL COMPLY WITH ALL REQUIREMENTS OF THE KIUC SERVICE INSTALLATION MANUAL.
- ⑧ PULLBOX SHALL BE PVC, MINIMUM DIMENSIONS 24"W X 32"H X 12"D, LOCKABLE TYPE. TERMINATE SERVICE CONDUCTORS IN PULLBOX AND PROVIDE 18" ADDITIONAL LENGTH FOR SPLICING. CONFIRM ALL REQUIREMENTS WITH KIUC PRIOR TO ORDERING.
- ⑨ MOUNT MAIN SERVICE PANELBOARD SUCH THAT IT DOES NOT BLOCK WINDOW OPENINGS.

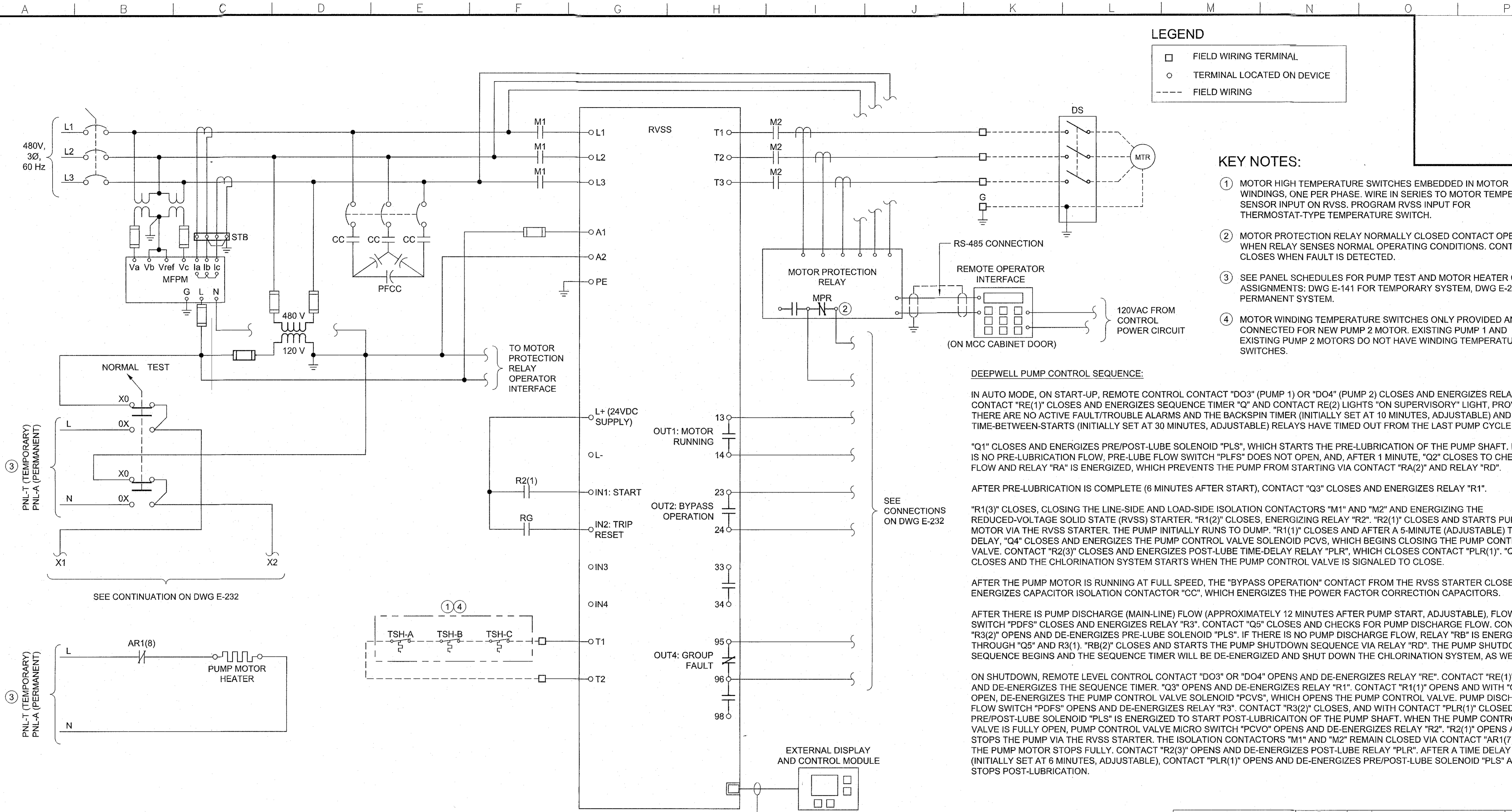
**KAUA'I ISLAND UTILITY COOPERATIVE
UNDERGROUND CONSTRUCTION NOTES AND REQUIREMENTS**

1. THESE NOTES ARE NOT INTENDED TO BE USED IN PLACE OF THE SERVICE INSTALLATION MANUAL, PLEASE REFER TO SERVICE INSTALLATION MANUAL FOR ALL SERVICE ISSUES.
2. CONTRACTOR SHALL CONTACT KAUA'I ISLAND UTILITY COOPERATIVE'S (KIUC) CONSTRUCTION COORDINATOR/INSPECTOR PRIOR TO START OF WORK ON KIUC FACILITIES AND FOR SCHEDULING SITE INSPECTIONS. (WESTSIDE: 246-2323 / EASTSIDE: 246-4343.)
3. CONTRACTOR SHALL CONTACT KIUC'S DISTRIBUTION PLANNING COORDINATOR AT 246-2373 FOR DESIGN APPROVALS, STANDARD DETAIL DRAWINGS, AND ANY ITEMS NOT ADDRESSED IN THESE NOTES OR DRAWINGS.
4. ALL CONTRACTORS ENTERING KIUC FACILITIES MUST BE APPROVED BY KIUC AND MUST HAVE PROPER LICENSING AND INSURANCE COVERAGE. CONTACT KIUC LEGAL COORDINATOR AT 246-4369 FOR DETAILS.
5. ALL TRENCHES AND PULLBOXES MUST BE INSPECTED BY KIUC PRIOR TO BACKFILLING AND CONCRETE-ENCASING OPERATIONS. FOR DETAILED TRENCHING AND BACKFILLING REQUIREMENTS REFER TO KIUC'S SERVICE INSTALLATION MANUAL.
6. THE CONTRACTOR SHALL PROVIDE A POLY-LINE 200 LB TEST LINE OR EQUIVALENT AS A PULLING WIRE IN ALL 1", 2", 3, AND 4" CONDUITS. IN 5" AND 6" CONDUITS, THE CONTRACTOR SHALL INSTALL NEPTCO WP1800 MULETAPE AS A PULLING LINE.
7. ALL CONDUITS, PULLBOXES, HANDHOLES, AND MANHOLES SHALL BE CLEANED AND FREE FROM OBJECTIONABLE MATERIALS. CONDUIT ENDS SHALL BE ADEQUATELY COVERED UNTIL THE CONDUCTOR IS INSTALLED BY THE ELECTRIC COMPANY. (COVERS SHALL BE CARLON PLUG WITH PULL TAB SERIES P258 EQUIVALENT OR BETTER.)
8. FOR ALL CONDUIT OTHER THAN SERVICES, REFER TO CONDUIT SCHEDULE ON DRAWINGS.
9. FOR ALL SERVICES WHERE THE CONDUCTOR IS #1/0 OR LESS, THE DISTANCE FROM KIUC'S HANDHOLE AND CUSTOMER'S METER IS LESS THAN 125 FEET, AND NOT CROSSING ANY DRIVEWAYS OR ROADS, THE CONDUIT SHALL BE 2-INCH SCHEDULE 40 PVC. FOR SERVICES GREATER THAN 125 FEET, CONTACT KIUC PLANNER FOR FIELD VERIFICATION AND UNDERGROUND SERVICE REQUIREMENTS. ANY DEVIATIONS WILL REQUIRE KIUC WRITTEN APPROVAL.
10. PRIMARY AND SECONDARY CONDUITS FOR *NEW LINE EXTENSIONS* SHALL BE SCHEDULE 40 PVC. (CARLON P&C DUCT TYPE DB EQUIVALENT OR BETTER.) UNDER DRIVEWAYS AND ROADWAYS, THE CONDUITS SHALL BE ENCASED IN A MINIMUM OF 3-INCH CONCRETE JACKET EXTENDING 12" OUTSIDE THE EDGE OF PAVEMENT.
11. SCHEDULE 80 PVC CONDUIT MAY BE SUBSTITUTED FOR THE CONCRETE-ENCASED SCHEDULE 40 PVC FOR *SERVICE CONDUIT ONLY* CROSSING UNDER UNPAVED PRIVATE DRIVEWAYS AND ROADWAYS FROM KIUC POLE/HANDHOLE TO CUSTOMER'S METER. IF CONCRETE DRIVEWAY WILL BE BUILT OVER SERVICE CONDUIT IMMEDIATELY AFTER CONDUIT IS INSTALLED, THEN SCHEDULE 40 PVC MAY BE USED PROVIDED THAT IT MEETS WITH RULE NO. 21.
12. ALL PRIMARY AND SECONDARY CONDUITS WHICH ARE CROSSING STATE OR COUNTY ROADWAYS SHALL BE SCHEDULE 40 PVC ENCASED IN A MINIMUM 3-INCH CONCRETE JACKET, WHICH SHALL EXTEND A MINIMUM OF 12 INCHES OUTSIDE THE EDGE OF PAVEMENT.
13. ELECTRICAL SUPPLY DUCTS, WHEN INSTALLED NEAR COMMUNICATION CABLES, SHALL BE SEPARATED FROM COMMUNICATION DUCT SYSTEMS AND BURIED COMMUNICATION CABLES OR CONDUCTORS BY NOT LESS THAN 3 INCHES OF CONCRETE OR 12 INCHES OF EARTH WHEN PARALLELING OR CROSSING.
14. CHAIRS SHALL BE INSTALLED AND SPACED AT A MAXIMUM OF 5 FEET SEPARATION WHEN CONCRETE ENCASING CONDUITS.
15. ALL CONDUITS SHALL ENTER BOXES AT 90-DEGREE ANGLES, PERPENDICULAR AND FLUSH TO THE WALL WITH BELL ENDS TO PREVENT CABLE DAMAGE.
16. 90-DEGREE CONDUIT BENDS SHALL BE FACTORY MADE WITH A MINIMUM RADIUS OF 3 FEET IN TRENCH RUNS.
17. CONDUIT BENDS EXCEEDING 90 DEGREES WILL NOT BE ACCEPTED.
18. A 36-INCH MINIMUM HORIZONTAL CLEARANCE SHALL BE MAINTAINED WHEN RUNNING KIUC CONDUITS PARALLEL TO WATER AND SEWER LINES. IF CLEARANCE IS LESS THAN 36 INCHES, KIUC CONDUITS SHALL BE CONCRETE ENCASED.
19. NO FOREIGN PULLBOXES, HANDHOLES, MANHOLES, CONCRETE SLABS/BOXES, STRUCTURES, ETC. ARE TO BE INSTALLED OVER KIUC FACILITIES WITH THE EXCEPTION OF HTI, CATV, OR WATERLINE CONDUIT CROSSINGS. SUCH CROSSINGS MUST BE APPROVED BY KIUC'S SERVICE ASSURANCE DEPARTMENT AND KIUC CONDUITS TO BE CONCRETE ENCASED. CONCRETE ENCASEMENT MUST BE MINIMUM OF 3-INCH ENCASEMENT AND EXTEND A MINIMUM OF 1 FOOT BEYOND CROSSING CONDUIT OR PIPE.
20. YELLOW MARKER TAPE TO BE PLACED 1 FOOT ABOVE ELECTRICAL CONDUITS IN THE TRENCH DURING BACKFILLING. (EZ CODE WBT 6-INCH WIDE, 4 MIL POLYETHYLENE PROTECT-A-LINE WARNING TAPE NA-0708 "ELECTRIC LINE" IN YELLOW, EQUIVALENT OR BETTER.)
21. UNLESS OTHERWISE NOTED, THE TOP OF ALL CONDUITS SHALL BE AT A DEPTH OF 24 INCHES.
22. ALL HANDHOLES, PULLBOXES, AND MANHOLES SHALL BE WALKER INDUSTRIES TYPE OR APPROVED EQUAL. CONTACT KIUC PRIOR TO ORDERING UNDERGROUND BOXES FOR VENDOR APPROVAL. CUSTOMER TO SUBMIT MANUFACTURER'S SHOP DRAWINGS IF SUBSTITUTING FROM WALKER INDUSTRIES TYPE.
23. TYPICALLY, THE TOP OF ALL ELECTRICAL UTILITY BOXES SHALL BE 1 INCH ABOVE FINISHED GRADE, SINGLE-PHASE TRANSFORMER PADS SHALL BE 2 INCHES ABOVE FINISHED GRADE, AND THREE-PHASE TRANSFORMER PADS SHALL BE 4 INCHES ABOVE FINISHED GRADE UNLESS OTHERWISE NOTED. (SPECIAL CONDITIONS MAY APPLY TO SIDEWALKS, ROADWAYS, ETC., SEE SPECIFIC LOCATION NOTATION.)
24. AT NO TIME SHALL CEMENT MORTAR, WOOD, OR ANY OTHER MATERIAL BE USED BETWEEN PRE-CAST SECTIONS OF KIUC PULLBOXES, HANDHOLES, OR MANHOLES. THE PERMANENT INSTALLATION OF WOODEN WEDGES TO LEVEL OR RAISE THE PRE-CAST SECTIONS SHALL NOT BE PERMITTED.
25. A MINIMUM OF 6 INCHES OR #3 CRUSHED ROCK BACKFILL SHALL BE PLACED LOOSELY BENEATH THE BOTTOM SECTION OF HANDHOLES AND PULLBOXES. CRUSHED ROCK OR OTHER FOREIGN MATERIALS ARE NOT TO BE PLACED INSIDE HANDHOLES AND PULLBOXES.

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">REVISION</th> <th style="width: 10%;">DATE</th> <th style="width: 10%;">SHEET</th> <th style="width: 10%;">BY</th> <th style="width: 10%;">APPROVED</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISION	DATE	SHEET	BY	APPROVED					
REVISION	DATE	SHEET	BY	APPROVED							
	DEPARTMENT OF WATER COUNTY OF KAUA'I JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUA'I, HAWAII										
ELECTRICAL EQUIPMENT ELEVATIONS AND DETAILS											
DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH											
APPROVED BY: <i>[Signature]</i> DATE: 3/4/19 <small>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUA'I</small>											
SHEET 52 OF 60 SHEETS E-222											

[Signature]
 KAUA'I ISLAND UTILITY COOPERATIVE (KIUC)
 APPROVAL SIGNATURE DATE: 3/27/19

Path: P:\Projects\Kauai County Of (h)\150756\Kilauea Wells Mcc Design\400 Design\CADD\2-SHEETS\ELECTRICAL - 150756-E-231.dwg Pld: Date: November 13, 2018 - 10:20 AM CADD User: Yolanda Noda



LEGEND

- FIELD WIRING TERMINAL
- TERMINAL LOCATED ON DEVICE
- FIELD WIRING

- KEY NOTES:**
- ① MOTOR HIGH TEMPERATURE SWITCHES EMBEDDED IN MOTOR WINDINGS, ONE PER PHASE. WIRE IN SERIES TO MOTOR TEMPERATURE SENSOR INPUT ON RVSS. PROGRAM RVSS INPUT FOR THERMOSTAT-TYPE TEMPERATURE SWITCH.
 - ② MOTOR PROTECTION RELAY NORMALLY CLOSED CONTACT OPENS WHEN RELAY SENSES NORMAL OPERATING CONDITIONS. CONTACT CLOSING WHEN FAULT IS DETECTED.
 - ③ SEE PANEL SCHEDULES FOR PUMP TEST AND MOTOR HEATER CIRCUIT ASSIGNMENTS: DWG E-141 FOR TEMPORARY SYSTEM, DWG E-241 FOR PERMANENT SYSTEM.
 - ④ MOTOR WINDING TEMPERATURE SWITCHES ONLY PROVIDED AND CONNECTED FOR NEW PUMP 2 MOTOR. EXISTING PUMP 1 AND EXISTING PUMP 2 MOTORS DO NOT HAVE WINDING TEMPERATURE SWITCHES.

DEEPWELL PUMP CONTROL SEQUENCE:

IN AUTO MODE, ON START-UP, REMOTE CONTROL CONTACT "DO3" (PUMP 1) OR "DO4" (PUMP 2) CLOSING AND ENERGIZES RELAY "RE". CONTACT "RE(1)" CLOSING AND ENERGIZES SEQUENCE TIMER "Q" AND CONTACT RE(2) LIGHTS "ON SUPERVISORY" LIGHT, PROVIDED THERE ARE NO ACTIVE FAULT/TROUBLE ALARMS AND THE BACKSPIN TIMER (INITIALLY SET AT 10 MINUTES, ADJUSTABLE) AND TIME-BETWEEN-STARTS (INITIALLY SET AT 30 MINUTES, ADJUSTABLE) RELAYS HAVE TIMED OUT FROM THE LAST PUMP CYCLE.

"Q1" CLOSING AND ENERGIZES PRE/POST-LUBE SOLENOID "PLS", WHICH STARTS THE PRE-LUBRICATION OF THE PUMP SHAFT. IF THERE IS NO PRE-LUBRICATION FLOW, PRE-LUBE FLOW SWITCH "PLFS" DOES NOT OPEN, AND, AFTER 1 MINUTE, "Q2" CLOSING TO CHECK FLOW AND RELAY "RA" IS ENERGIZED, WHICH PREVENTS THE PUMP FROM STARTING VIA CONTACT "RA(2)" AND RELAY "RD".

AFTER PRE-LUBRICATION IS COMPLETE (6 MINUTES AFTER START), CONTACT "Q3" CLOSING AND ENERGIZES RELAY "R1".

"R1(3)" CLOSING, CLOSING THE LINE-SIDE AND LOAD-SIDE ISOLATION CONTACTORS "M1" AND "M2" AND ENERGIZING THE REDUCED-VOLTAGE SOLID STATE (RVSS) STARTER. "R1(2)" CLOSING, ENERGIZING RELAY "R2". "R2(1)" CLOSING AND STARTS PUMP MOTOR VIA THE RVSS STARTER. THE PUMP INITIALLY RUNS TO DUMP. "R1(1)" CLOSING AND AFTER A 5-MINUTE (ADJUSTABLE) TIME DELAY, "Q4" CLOSING AND ENERGIZES THE PUMP CONTROL VALVE SOLENOID PCVS, WHICH BEGINS CLOSING THE PUMP CONTROL VALVE. CONTACT "R2(3)" CLOSING AND ENERGIZES POST-LUBE TIME-DELAY RELAY "PLR", WHICH CLOSING CONTACT "PLR(1)". "Q6" CLOSING AND THE CHLORINATION SYSTEM STARTS WHEN THE PUMP CONTROL VALVE IS SIGNALLED TO CLOSE.

AFTER THE PUMP MOTOR IS RUNNING AT FULL SPEED, THE "BYPASS OPERATION" CONTACT FROM THE RVSS STARTER CLOSING AND ENERGIZES CAPACITOR ISOLATION CONTACTOR "CC", WHICH ENERGIZES THE POWER FACTOR CORRECTION CAPACITORS.

AFTER THERE IS PUMP DISCHARGE (MAIN-LINE) FLOW (APPROXIMATELY 12 MINUTES AFTER PUMP START, ADJUSTABLE), FLOW SWITCH "PDFS" CLOSING AND ENERGIZES RELAY "R3". CONTACT "Q5" CLOSING AND CHECKS FOR PUMP DISCHARGE FLOW. CONTACT "R3(2)" OPENS AND DE-ENERGIZES PRE-LUBE SOLENOID "PLS". IF THERE IS NO PUMP DISCHARGE FLOW, RELAY "RB" IS ENERGIZED THROUGH "Q5" AND R3(1). "RB(2)" CLOSING AND STARTS THE PUMP SHUTDOWN SEQUENCE VIA RELAY "RD". THE PUMP SHUTDOWN SEQUENCE BEGINS AND THE SEQUENCE TIMER WILL BE DE-ENERGIZED AND SHUT DOWN THE CHLORINATION SYSTEM, AS WELL.

ON SHUTDOWN, REMOTE LEVEL CONTROL CONTACT "DO3" OR "DO4" OPENS AND DE-ENERGIZES RELAY "RE". CONTACT "RE(1)" OPENS AND DE-ENERGIZES THE SEQUENCE TIMER. "Q3" OPENS AND DE-ENERGIZES RELAY "R1". CONTACT "R1(1)" OPENS AND WITH "Q4" OPEN, DE-ENERGIZES THE PUMP CONTROL VALVE SOLENOID "PCVS", WHICH OPENS THE PUMP CONTROL VALVE. PUMP DISCHARGE FLOW SWITCH "PDFS" OPENS AND DE-ENERGIZES RELAY "R3". CONTACT "R3(2)" CLOSING, AND WITH CONTACT "PLR(1)" CLOSING, PRE/POST-LUBE SOLENOID "PLS" IS ENERGIZED TO START POST-LUBRICATION OF THE PUMP SHAFT. WHEN THE PUMP CONTROL VALVE IS FULLY OPEN, PUMP CONTROL VALVE MICRO SWITCH "PCVO" OPENS AND DE-ENERGIZES RELAY "R2". "R2(1)" OPENS AND STOPS THE PUMP VIA THE RVSS STARTER. THE ISOLATION CONTACTORS "M1" AND "M2" REMAIN CLOSED VIA CONTACT "AR1(7)" UNTIL THE PUMP MOTOR STOPS FULLY. CONTACT "R2(3)" OPENS AND DE-ENERGIZES POST-LUBE RELAY "PLR". AFTER A TIME DELAY (INITIALLY SET AT 6 MINUTES, ADJUSTABLE), CONTACT "PLR(1)" OPENS AND DE-ENERGIZES PRE/POST-LUBE SOLENOID "PLS" AND STOPS POST-LUBRICATION.

CONTROL DEVICE DESIGNATIONS

ABBREVIATION	DESCRIPTION	ABBREVIATION	DESCRIPTION
AR1	MOTOR RUNNING AUXILIARY RELAY	R2	RVSS/MOTOR START RELAY
CC	CAPACITOR ISOLATION CONTACTOR	R3	PUMP DISCHARGE FLOW RELAY
DS	PUMP MOTOR DISCONNECT SWITCH	RA	PRE-LUBE NO FLOW RELAY
M1	LINE-SIDE ISOLATION CONTACTOR	RB	PUMP DISCHARGE NO FLOW RELAY
M2	LOAD-SIDE ISOLATION CONTACTOR	RBT	PUMP BACKSPIN TIMING RELAY
MFPM	MULTI-FUNCTION POWER MONITOR	RC	PUMP HIGH DISCHARGE PRESSURE RELAY
MPR	MOTOR PROTECTION RELAY OUTPUT CONTACT	RD	GENERAL FAULT/TROUBLE RELAY
PCVO	PUMP CONTROL VALVE OPEN LIMIT SWITCH	RE	PUMP RUN RELAY
PCVS	PUMP CONTROL VALVE SOLENOID	RF	PUMP RUN INHIBIT RELAY
PDFS	PUMP DISCHARGE FLOW SWITCH	RG	RVSS FAULT RESET RELAY
PFCC	POWER FACTOR CORRECTION CAPACITOR	RTBS	PUMP TIME-BETWEEN-STARTS RELAY
PLFS	PRE-LUBE FLOW SWITCH	RVSS	REDUCED-VOLTAGE SOLID-STATE SOFT STARTER
PLR	POST-LUBE TIMING RELAY	T	MECHANICAL TIMECLOCK OUTPUT CONTACT
PLS	PRE/POST-LUBE SOLENOID	TSH-A	MOTOR WINDING TEMPERATURE SWITCH, PHASE A
Q	SEQUENCE TIMER OUTPUT CONTACT	TSH-B	MOTOR WINDING TEMPERATURE SWITCH, PHASE B
R1	PRE-LUBE CYCLE COMPLETE RELAY	TSH-C	MOTOR WINDING TEMPERATURE SWITCH, PHASE C

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

REVISION DATE SHEET BY APPROVED

CLAY K. OZAKI, F.R.A.M.
 LICENSED PROFESSIONAL ENGINEER
 No. 17340-E
 HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.")

DEPARTMENT OF WATER
 COUNTY OF KAUAI
 JOB NO. WKK-03
MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2
 KILAUEA, KAUAI, HAWAII

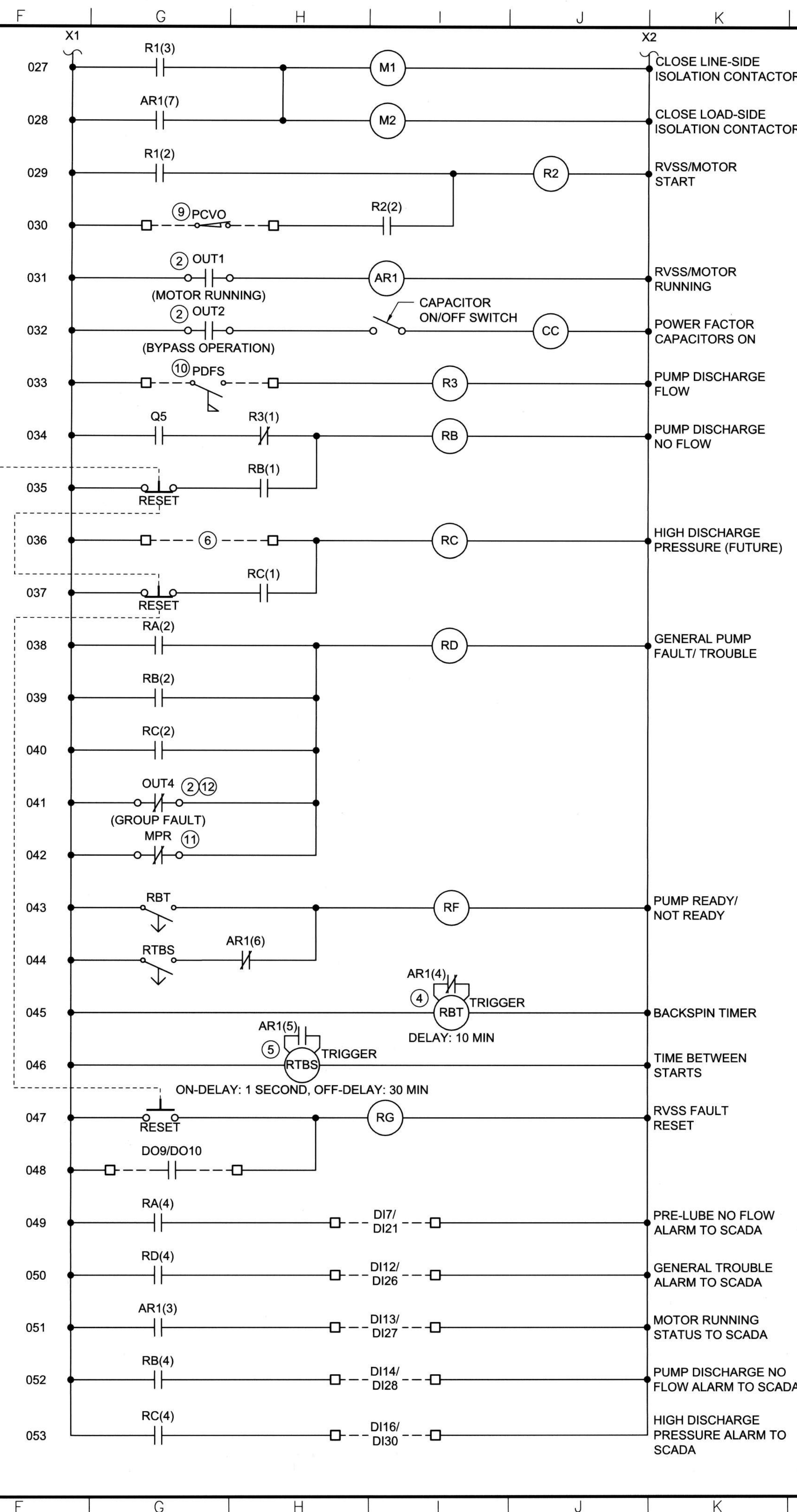
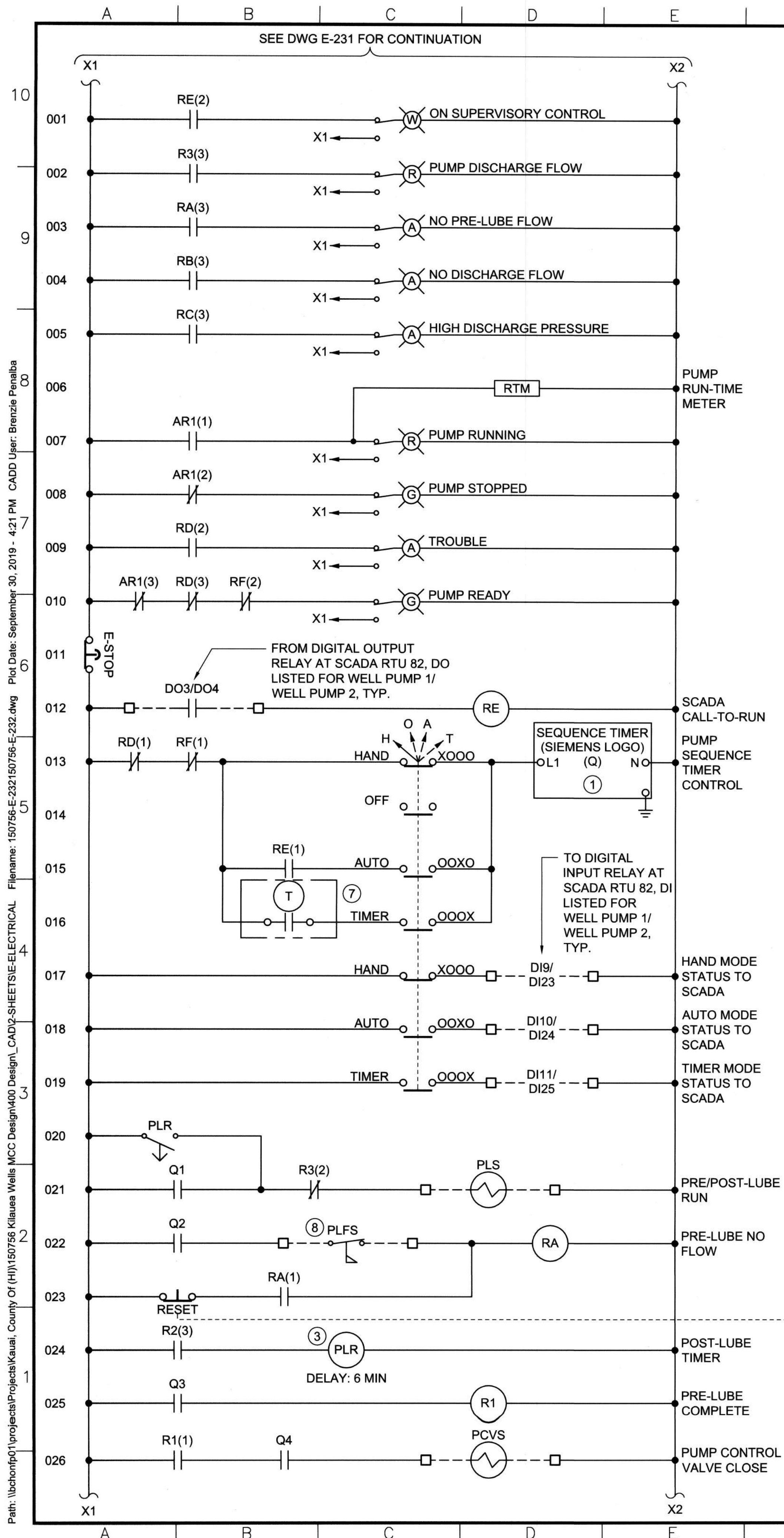
TYPICAL WELL PUMP CONTROL DIAGRAM - 1

DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH

APPROVED BY: *[Signature]* 3/11/19
 MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI

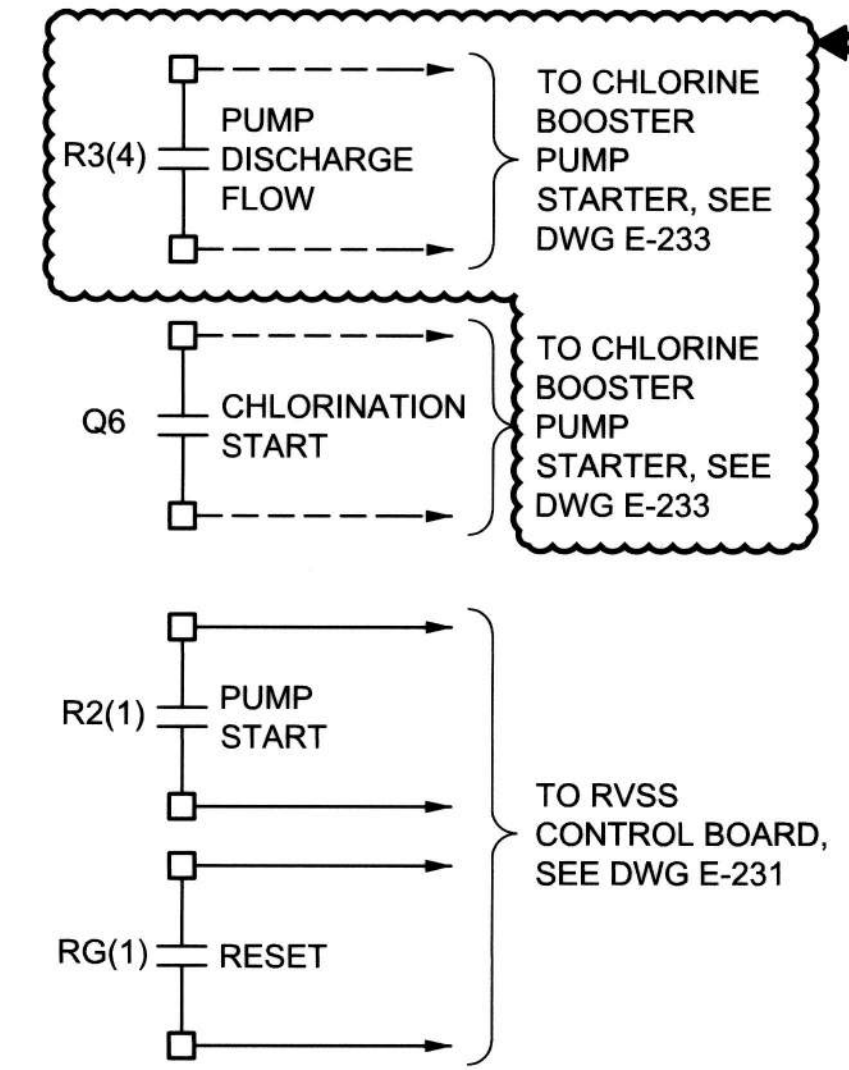
BY: *[Signature]* 4/30/20 EXP. DATE

SHEET 53 OF 60 SHEETS E-231



LEGEND

- FIELD WIRING TERMINAL
- TERMINAL LOCATED ON DEVICE
- - - FIELD WIRING



- KEY NOTES:**
- PROGRAM PLC SEQUENCE TIMER OUTPUTS ACCORDING TO SEQUENCE TIMER BAR GRAPH, ABOVE, AND PUMP CONTROL SEQUENCE DESCRIPTION ON DWG E-231.
 - CONTACT FROM OUTPUT RELAY ON RVSS.
 - PROGRAM POST-LUBE TIMING RELAY PLR FOR STANDARD DELAY-ON-BREAK FUNCTION. INITIAL SETTING FOR RELAY PLR TIME DELAY SHALL BE 6 MINUTES (ADJUSTABLE).
 - PROGRAM BACKSPIN TIMING RELAY RBT FOR SINGLE-SHOT FUNCTION. NORMALLY CLOSED CONTACT AR1(4) SHALL FUNCTION AS THE TRIGGER. INITIAL SETTING FOR RELAY RBT TIME DELAY SHALL BE 10 MINUTES (ADJUSTABLE). AT INITIAL STARTUP, CONTRACTOR SHALL TIME THE ACTUAL PUMP BACKSPIN TIME AND SET THE BACKSPIN TIMING RELAY FOR DOUBLE THE RECORDED BACKSPIN TIME.
 - PROGRAM TIME-BETWEEN-STARTS RELAY RTBS FOR DELAY-ON-MAKE, SINGLE-SHOT FUNCTION. NORMALLY OPEN CONTACT AR1(5) SHALL FUNCTION AS THE TRIGGER. INITIAL SETTINGS FOR RELAY RTBS TIME DELAYS SHALL BE 1 SECOND DELAY-ON-MAKE AND 30 MINUTES DELAY-ON-BREAK (BOTH ADJUSTABLE).
 - PROVISIONS FOR FUTURE HIGH DISCHARGE PRESSURE SWITCH. PROVIDE FIELD WIRING TERMINALS AND SPARE WIRING TO PUMP CONTROL JUNCTION BOX.
 - MECHANICAL TIMECLOCK MOUNTED ON FRONT OF MCC CABINET DOOR FOR TIMED OPERATION WITHOUT SCADA.
 - PRE-LUBE FLOW SWITCH OPENS WITH FLOW.
 - PUMP CONTROL VALVE LIMIT SWITCH OPENS WHEN VALVE IS FULLY OPEN.
 - PUMP DISCHARGE FLOW SWITCH CLOSURES WITH MAIN-LINE FLOW.
 - FROM MOTOR PROTECTION RELAY, SEE DWG E-231. NORMALLY CLOSED CONTACT IS OPEN UNDER NORMAL OPERATING CONDITIONS.
 - RVSS GROUP FAULT NORMALLY CLOSED CONTACT OPEN/DEENERGIZED UNDER NORMAL OPERATING CONDITIONS.

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

REVISION 1 9/27/19 DATE DOW OPS COMMENTS COT BY APPROVED

DEPARTMENT OF WATER
COUNTY OF KAUAI

JOB NO. WKK-03

MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2 KĪLAUEA, KAUAI, HAWAII

TYPICAL WELL PUMP CONTROL DIAGRAM - 2

DESIGNED BY COT DRAWN BY SC CHECKED BY SH

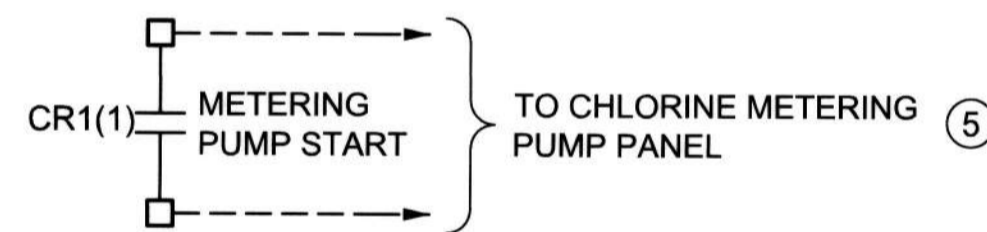
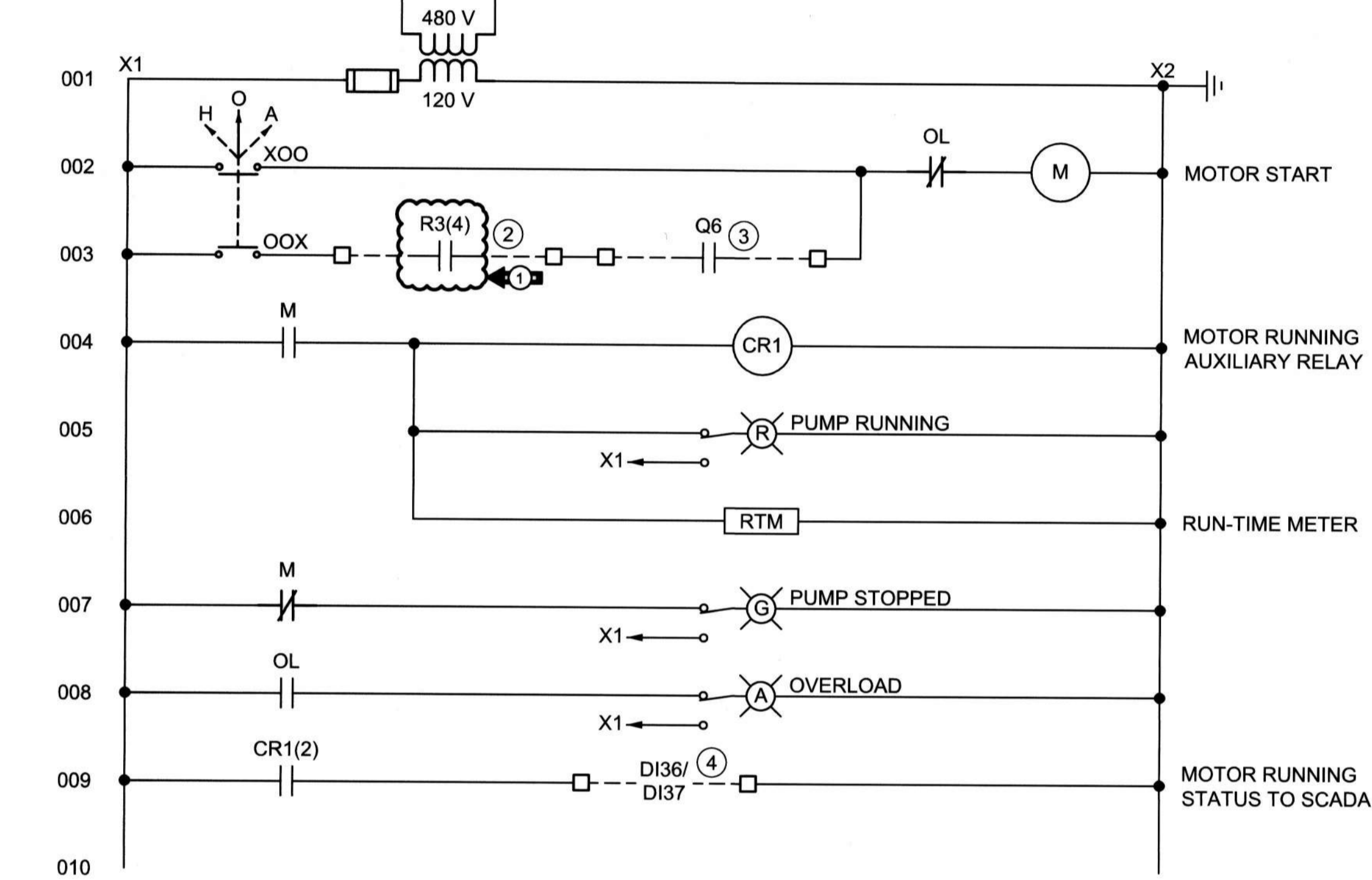
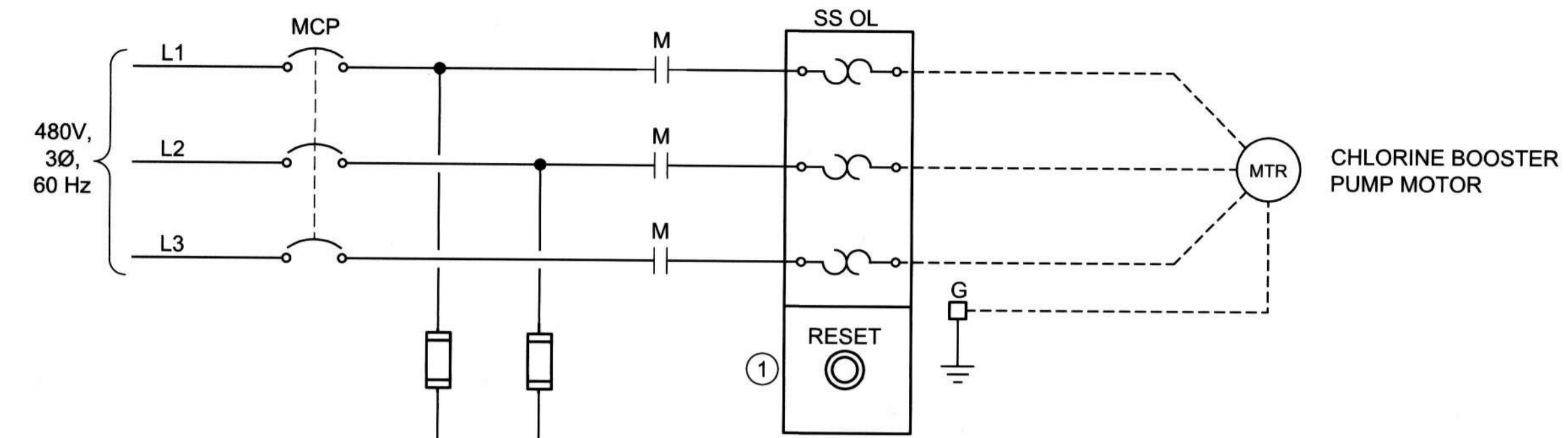
APPROVED BY: *[Signature]* 10/22/19 DATE

BY: *[Signature]* 4/30/20 EXP DATE

SHEET 54 OF 60 SHEETS E-232

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LEGEND

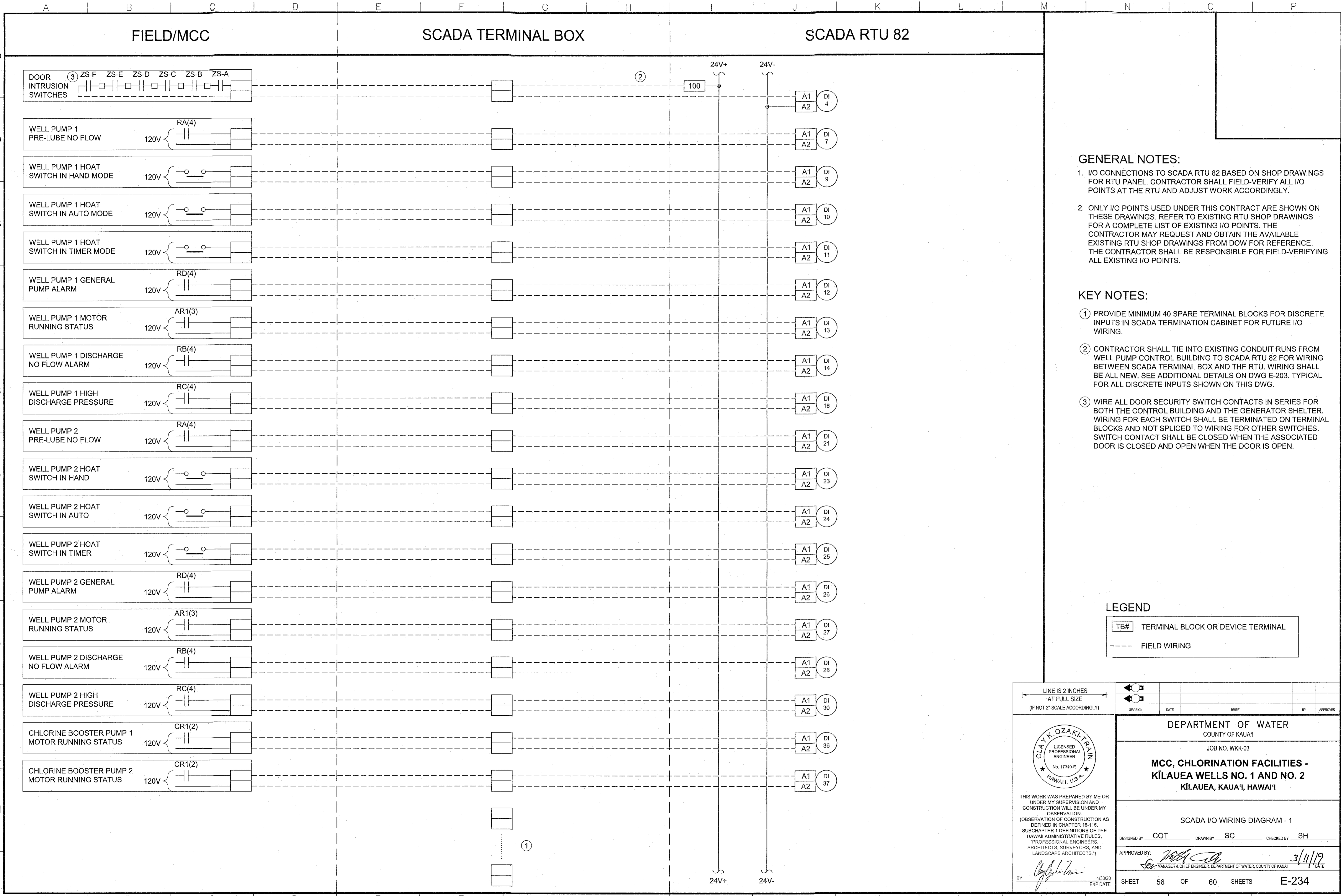
- FIELD WIRING TERMINAL
- TERMINAL LOCATED ON DEVICE
- FIELD WIRING

KEY NOTES:

- ① PROVIDE MECHANICAL RESET EXTENSION ASSEMBLY WITH RESET PUSHBUTTON MOUNTED TO FRONT OF MCC CUBICLE DOOR FOR OVERLOAD RESET.
- ② R3(4) CONTACT FROM WELL PUMP 1 CONTROL CIRCUIT TO CHLORINE BOOSTER PUMP 1. R3(4) CONTACT FROM WELL PUMP 2 CONTROL CIRCUIT TO CHLORINE BOOSTER PUMP 2. SEE DWG E-232.
- ③ CALL-TO-RUN FROM WELL PUMP CONTROL CIRCUIT. Q6 CONTACT FOR CHLORINE BOOSTER PUMP 1 FROM WELL PUMP 1 SEQUENCE TIMER. Q6 CONTACT FOR CHLORINE BOOSTER PUMP 2 FROM WELL PUMP 2 SEQUENCE TIMER.
- ④ MOTOR RUNNING STATUS TO DIGITAL INPUT RELAY AT SCADA RTU 82. DI LISTED FOR CHLORINE BOOSTER PUMP 1/ CHLORINE BOOSTER PUMP 2.
- ⑤ WIRE CR1(1) CONTACT TO EXISTING CHLORINE METERING PUMP PANEL. ENERGIZE CONTACT FROM POWER TERMINAL IN CHLORINE METERING PUMP PANEL. CR1(1) CONTACT FROM CHLORINE BOOSTER PUMP 1 SHALL ACTIVATE CHLORINE METERING PUMP 1. CR1(1) CONTACT FROM CHLORINE BOOSTER PUMP 2 SHALL ACTIVATE CHLORINE METERING PUMP 2. CONTRACTOR SHALL FIELD-VERIFY WIRING AND CONTROLS FOR THE CHLORINE METERING PUMPS AND MAINTAIN EXISTING OPERATION/ FUNCTIONALITY OF THE CHLORINATION SYSTEM.

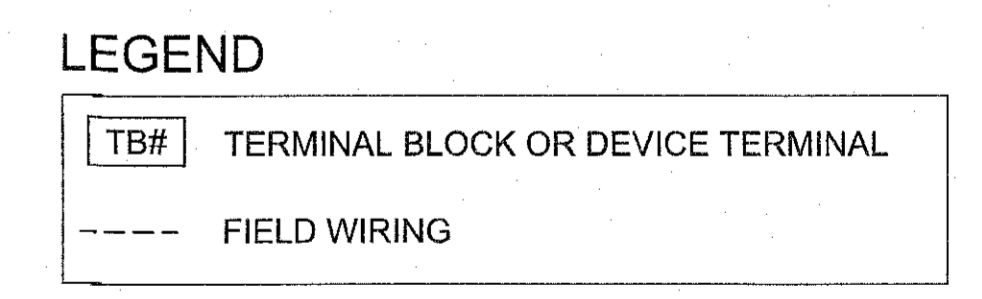
	LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)		9/27/19	DOW OPS COMMENTS	COT
	REVISION 1	DATE	BRIEF	BY	APPROVED
DEPARTMENT OF WATER COUNTY OF KAUAI					
JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2 KĪLAUEA, KAUAI, HAWAII					
TYPICAL CHLORINE BOOSTER PUMP CONTROL DIAGRAM					
DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH					
APPROVED BY: DATE: 10/22/19					
BY: 4/30/20 EXP DATE					
SHEET 55 OF 60 SHEETS E-233					

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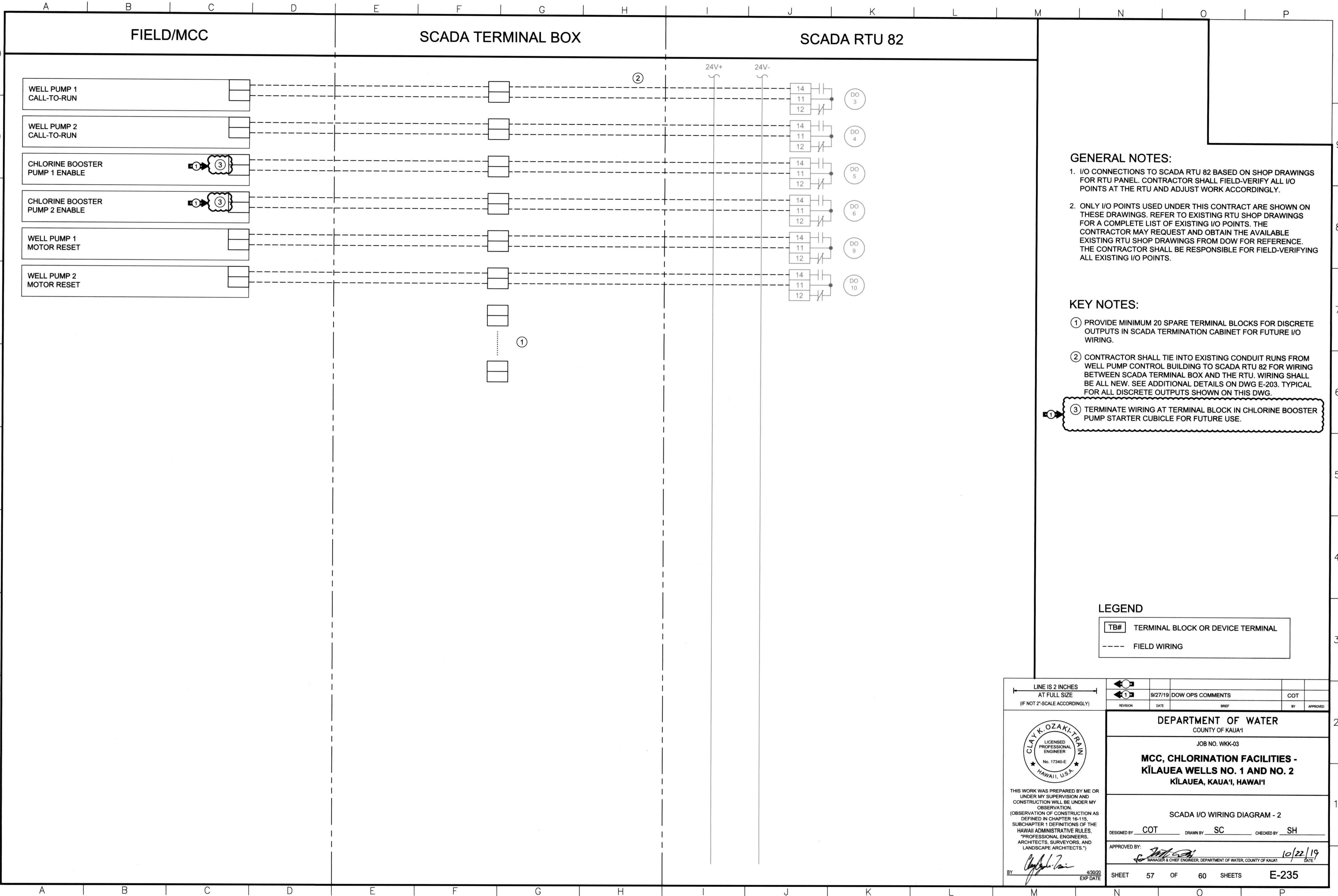
- GENERAL NOTES:**
- I/O CONNECTIONS TO SCADA RTU 82 BASED ON SHOP DRAWINGS FOR RTU PANEL. CONTRACTOR SHALL FIELD-VERIFY ALL I/O POINTS AT THE RTU AND ADJUST WORK ACCORDINGLY.
 - ONLY I/O POINTS USED UNDER THIS CONTRACT ARE SHOWN ON THESE DRAWINGS. REFER TO EXISTING RTU SHOP DRAWINGS FOR A COMPLETE LIST OF EXISTING I/O POINTS. THE CONTRACTOR MAY REQUEST AND OBTAIN THE AVAILABLE EXISTING RTU SHOP DRAWINGS FROM DOW FOR REFERENCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-VERIFYING ALL EXISTING I/O POINTS.

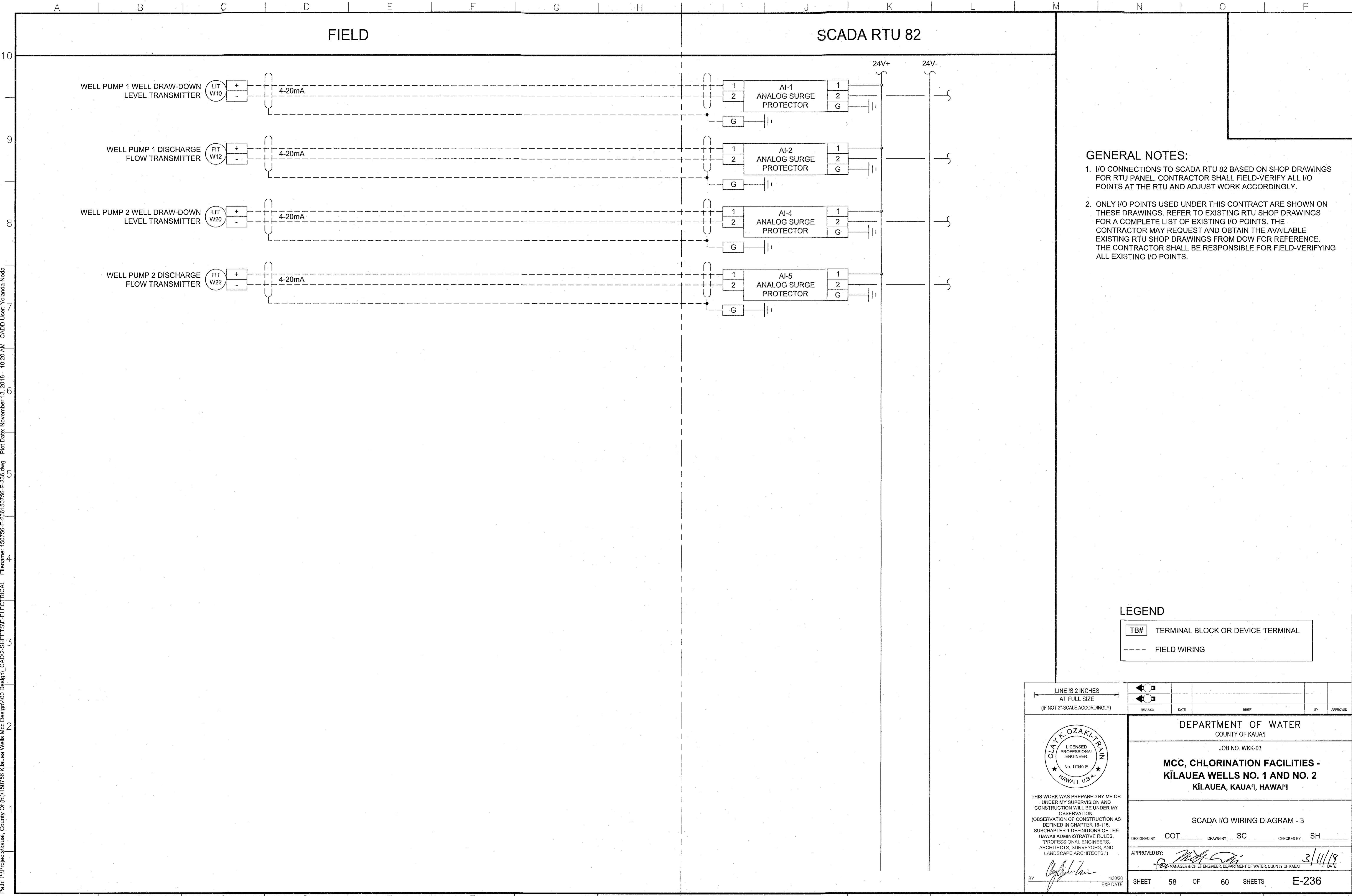
- KEY NOTES:**
- PROVIDE MINIMUM 40 SPARE TERMINAL BLOCKS FOR DISCRETE INPUTS IN SCADA TERMINATION CABINET FOR FUTURE I/O WIRING.
 - CONTRACTOR SHALL TIE INTO EXISTING CONDUIT RUNS FROM WELL PUMP CONTROL BUILDING TO SCADA RTU 82 FOR WIRING BETWEEN SCADA TERMINAL BOX AND THE RTU. WIRING SHALL BE ALL NEW. SEE ADDITIONAL DETAILS ON DWG E-203. TYPICAL FOR ALL DISCRETE INPUTS SHOWN ON THIS DWG.
 - WIRE ALL DOOR SECURITY SWITCH CONTACTS IN SERIES FOR BOTH THE CONTROL BUILDING AND THE GENERATOR SHELTER. WIRING FOR EACH SWITCH SHALL BE TERMINATED ON TERMINAL BLOCKS AND NOT SPliced TO WIRING FOR OTHER SWITCHES. SWITCH CONTACT SHALL BE CLOSED WHEN THE ASSOCIATED DOOR IS CLOSED AND OPEN WHEN THE DOOR IS OPEN.



<p>LINE IS 2 INCHES AT FULL SIZE (IF NOT 2" SCALE ACCORDINGLY)</p> <p>THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.)</p> <p>BY: <i>Clay K. Ozaki</i> 4/30/20 EXP. DATE</p>	<table border="1"> <tr> <th>REVISION</th> <th>DATE</th> <th>BY</th> <th>APPROVED</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISION	DATE	BY	APPROVED				
	REVISION	DATE	BY	APPROVED					
<p>DEPARTMENT OF WATER COUNTY OF KAUAI</p> <p>JOB NO. WKK-03</p> <p>MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2 KILAUEA, KAUAI, HAWAII</p> <p>SCADA I/O WIRING DIAGRAM - 1</p> <p>DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH</p> <p>APPROVED BY: <i>[Signature]</i> 3/11/19 DATE</p> <p>MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI</p>	<p>SHEET 56 OF 60 SHEETS E-234</p>								

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- GENERAL NOTES:**
1. I/O CONNECTIONS TO SCADA RTU 82 BASED ON SHOP DRAWINGS FOR RTU PANEL. CONTRACTOR SHALL FIELD-VERIFY ALL I/O POINTS AT THE RTU AND ADJUST WORK ACCORDINGLY.
 2. ONLY I/O POINTS USED UNDER THIS CONTRACT ARE SHOWN ON THESE DRAWINGS. REFER TO EXISTING RTU SHOP DRAWINGS FOR A COMPLETE LIST OF EXISTING I/O POINTS. THE CONTRACTOR MAY REQUEST AND OBTAIN THE AVAILABLE EXISTING RTU SHOP DRAWINGS FROM DOW FOR REFERENCE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD-VERIFYING ALL EXISTING I/O POINTS.

LEGEND

TB#	TERMINAL BLOCK OR DEVICE TERMINAL
---	FIELD WIRING

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

REVISION	DATE	SHEET	BY	APPROVED

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.)

BY: *Clay K. Ozaki* 4/30/20 EXP. DATE

DEPARTMENT OF WATER
COUNTY OF KAUAI

JOB NO. WKK-03

MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2
KĪLAUEA, KAUAI, HAWAII

SCADA I/O WIRING DIAGRAM - 3

DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH

APPROVED BY: *[Signature]* 3/11/19 DATE
MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI

SHEET 58 OF 60 SHEETS E-236

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PANEL SCHEDULE PNL-A		KĪLAUEA WELLS										(PERMANENT SYSTEM)									
208 V 120 VOLTS	NORMAL POWER	BUS RATING: 100	AMPS	LOCATION: INSIDE CONTROL BUILDING	FEED-THRU LUGS	NO															
3 -PHASE	PNL MFR:	MAIN: CB	100	AMPS	MOUNTING: WALL-MOUNTED	DOUBLE LUGS	NO														
4 -WIRE	CAT. NO.:	A.I.C. RATING: 18k		A.C. SYMM(NOTE 3)	FED FROM: MCC VIA FMR-A	ISOLATED GND	NO														
	REF. DWG.:				CONDUCTORS:	200% NEUTRAL	NO														
CKT NO.	CIRCUIT DESCRIPTION	CODE	LOAD (kVA)	BKR AMPS	PH AMPS	BKR AMPS	LOAD (kVA)	CODE	CIRCUIT DESCRIPTION	CKT NO.											
1	CONTROL BUILDING INTERIOR LIGHTS	L	0.20	20	-A-	20	0.90	R	CONTROL BUILDING RECEPTACLES	2											
3	FLOODLIGHT	L	0.20	20	-B-	20	1.80	LM	AIR COMPRESSOR RECEPTACLE	4											
5	CHLORINATION CONTROL PANEL (SEE NOTE 1)	Z	0.10	20	-C-	20	1.00	Z	RTU #1 (SEE NOTE 1)	6											
7	PUMP #1 HEATER	Z	0.50	20	-A-	20	1.00	Z	RTU #2 (SEE NOTE 1)	8											
9	PUMP #2 HEATER	Z	0.50	20	-B-	20	1.00	Z	PUMP #1 TEST	10											
11			0.63		-C-	20	1.00	Z	PUMP #2 TEST	12											
13	GENERATOR SHELTER PNL-B	Z	0.63	40	-A-	20			SPARE	14											
15			0.63		-B-	20			SPARE	16											
17	SPARE			20	-C-	20			SPARE	18											
19	SPARE			20	-A-	20			SPARE	20											
21	SPARE			20	-B-	20			SPARE	22											
23	SPARE			20	-C-	20			SPARE	24											
25	SPARE			20	-A-	20			SPARE	26											
27	SPARE			20	-B-	20			SPARE	28											
29	SPARE			20	-C-	20			SPARE	30											

CODES:	CONNECTED LOAD	CALCULATED DEMAND LOAD	NOTES:
H = HVAC LOADS	0.00 kVA	0.00 kVA (100%)	1 EXISTING LOAD CONNECTED TO THIS PANEL.
L = LIGHTING LOADS	0.40 kVA	0.50 kVA (125%)	2 GFCI TYPE BREAKER.
LM = LARGEST SINGLE MOTOR	1.80 kVA	2.25 kVA (125%)	3 THE AIC RATING LISTED IS A MINIMUM ALLOWABLE. ACTUAL AIC RATING SHALL BE VERIFIED WITH THE SHORT CIRCUIT STUDY REQUIRED BY SP-8.7.
M = OTHER MOTOR LOADS	0.00 kVA	0.00 kVA (100%)	
NC = NON-COINCIDENTAL LOADS	0.00 kVA	0.00 kVA (0%)	
R = GENERAL USE RECEPTACLES	0.90 kVA	0.90 kVA (50%>10kVA)	
S = DEDICATED RECEPTACLES	0.00 kVA	0.00 kVA (100%)	
Z = MISC. OR APPLIANCES	6.99 kVA	6.99 kVA (100%)	
TOTALS:	10.09 kVA	10.64 kVA	PHASE BALANCE ONLY
	28 AMPS	30 AMPS	PHASE A 27 AMPS
			PHASE B 34 AMPS
			PHASE C 23 AMPS

PANEL SCHEDULE PNL-B		KĪLAUEA WELLS										(PERMANENT SYSTEM)									
208 V 120 VOLTS	NORMAL POWER	BUS RATING: 100	AMPS	LOCATION: INSIDE GEN SHELTER	FEED-THRU LUGS	NO															
3 -PHASE	PNL MFR:	MAIN: CB	40	AMPS	MOUNTING: WALL	DOUBLE LUGS	NO														
4 -WIRE	CAT. NO.:	A.I.C. RATING: 18k		A.C. SYMM(NOTE 3)	FED FROM: PNL-A	ISOLATED GND	NO														
	REF. DWG.:				CONDUCTORS:	200% NEUTRAL	NO														
CKT NO.	CIRCUIT DESCRIPTION	CODE	LOAD (kVA)	BKR AMPS	PH AMPS	BKR AMPS	LOAD (kVA)	CODE	CIRCUIT DESCRIPTION	CKT NO.											
1	INTERIOR LIGHTS	L	0.30	20	-A-	20	0.54	R	BUILDING RECEPTACLES	2											
3	EXTERIOR LIGHTS	L	0.35	20	-B-	20			SPARE	4											
5	BUILDING RECEPTACLES	R	0.54	20	-C-	20			SPARE	6											
7	SPARE			20	-A-	20			SPARE	8											
9	SPARE			20	-B-	20			SPARE	10											
11	SPARE			20	-C-	20			SPARE	12											
13	SPARE			20	-A-	20			SPARE	14											
15	SPARE			20	-B-	20			SPARE	16											
17	SPARE			20	-C-	20			SPARE	18											

CODES:	CONNECTED LOAD	CALCULATED DEMAND LOAD	NOTES:
H = HVAC LOADS	0.00 kVA	0.00 kVA (100%)	1 EXISTING LOAD CONNECTED TO THIS PANEL.
L = LIGHTING LOADS	0.65 kVA	0.81 kVA (125%)	2 GFCI TYPE BREAKER.
LM = LARGEST SINGLE MOTOR	0.00 kVA	0.00 kVA (125%)	3 THE AIC RATING LISTED IS A MINIMUM ALLOWABLE. ACTUAL AIC RATING SHALL BE VERIFIED WITH THE SHORT CIRCUIT STUDY REQUIRED BY SP-8.7.
M = OTHER MOTOR LOADS	0.00 kVA	0.00 kVA (100%)	
NC = NON-COINCIDENTAL LOADS	0.00 kVA	0.00 kVA (0%)	
R = GENERAL USE RECEPTACLES	1.08 kVA	1.08 kVA (50%>10kVA)	
S = DEDICATED RECEPTACLES	0.00 kVA	0.00 kVA (100%)	
Z = MISC. OR APPLIANCES	0.00 kVA	0.00 kVA (100%)	
TOTALS:	1.73 kVA	1.89 kVA	PHASE BALANCE ONLY
	5 AMPS	5 AMPS	PHASE A 7 AMPS
			PHASE B 3 AMPS
			PHASE C 5 AMPS

LUMINAIRE SCHEDULE							
TYPE	DESCRIPTION	MOUNTING	LUMENS	FIXTURE VOLTAGE	AVERAGE SYSTEM WATTS	COLOR TEMPERATURE	MANUFACTURERS CATALOG NUMBER
A	4' SEALED INDUSTRIAL LED LUMINAIRE, SUITABLE FOR INDOOR AND OUTDOOR USE AND WET LOCATIONS, RATED IP65. NON-CORROSIVE FIBERGLASS HOUSING, CLOSED-CELL FOAM GASKET. ENHANCED LED ACRYLIC LENS. HIGH-EFFICIENCY LED'S WITH 100,000 HOUR RATED LIFE (L70), 4000K COLOR TEMPERATURE, MINIMUM 80CRI. HIGH-EFFICIENCY DIMMABLE LED DRIVER. PROVIDE WITH MANUFACTURER'S MOUNTING BRACKETS. FIVE-YEAR WARRANTY	WALL/SURFACE (CEILING)	4431	120-277V	38	4000K	PHILIPS DAY-BRITE VAPORLUME LED DWLE43L840-4-UNV OR APPROVED EQUAL
B	WALL SCONCE LUMINAIRE, SUITABLE FOR OUTDOOR INSTALLATION AND WET LOCATIONS. DIE-CAST ALUMINUM HOUSING, IP65 RATED, TEXTURED BRONZE FINISH. 16 LED ARRAY WITH 200,000 HOUR LIFE (L70), 4000K COLOR TEMPERATURE, MINIMUM 70 CRI. HIGH-EFFICIENCY LED DRIVER. INTEGRATED BUTTON PHOTOCELL. FULL-CUTOFF OPTICS. MOUNT TO RECESSED JUNCTION BOX. FIVE-YEAR WARRANTY.	WALL	3374	120V	36	4000K	PHILIPS LYTEPRO LED SCONCE LPW16-71BZPCB OR APPROVED EQUAL
C	INDUSTRIAL LED FLOODLIGHT, DIE-CAST ALUMINUM HOUSING, SUITABLE FOR OUTDOOR AND WET LOCATIONS, IP66 RATED, POWDERCOAT FINISH. 64 LED ARRAY, 4000K COLOR TEMPERATURE, MINIMUM 70 CRI, 100,000 RATED LIFE (L70). 530mA DRIVE CURRENT. HIGH POWER FACTOR DIMMABLE ELECTRONIC DRIVER. INTEGRATED BUTTON PHOTOCELL FULL-CUTOFF TEMPERED GLASS LENS, ASYMMETRIC 33 DEGREE FLOOD DISTRIBUTION. INTEGRATED SURGE PROTECTION. FIELD-ROTATABLE YOKE. PROVIDE WITH WALL MOUNT ARM WITH TENON AND GLARE SHIELD. FIVE-YEAR WARRANTY.	WALL (TENON)	12639	120V	106	4000K	PHILIPS FX1 LED FX164G2THA33NA5EDMGSP1 OR APPROVED EQUAL

GENERAL NOTES:

- ALL EXTERIOR LIGHT FIXTURES SHALL BE DOWNWARD-FACING, FULL-CUTOFF TYPE, AND COMPLY WITH SHEARWATER PROTECTION REQUIREMENTS.

LINE IS 2 INCHES AT FULL SIZE (IF NOT 2"-SCALE ACCORDINGLY)		REVISION	DATE	BREF	BY	APPROVED
		DEPARTMENT OF WATER COUNTY OF KAUAI JOB NO. WKK-03 MCC, CHLORINATION FACILITIES - KĪLAUEA WELLS NO. 1 AND NO. 2 KĪLAUEA, KAUAI, HAWAII				
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION. (OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 16-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.) BY: <i>Clay K. Ozaki-Train</i> 4/30/20 EXP. DATE		ELECTRICAL SCHEDULES - 1 DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH APPROVED BY: <i>Scott C. Oshiro</i> 3/11/19 MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI				
SHEET 59 OF 60 SHEETS		E-241				

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CONDUIT SCHEDULE					
CONDUIT TAG	CONDUIT (QTY) SIZE	CONTENTS	FROM	TO	NOTES/DESCRIPTION
C-CB-T	(1) 1-1/2"	10-#12, 1-#12 GND	TEMPORARY CONTROLS JUNCTION BOX	TEMPORARY MCC	
C-CCP	(1) 3/4"	4-#12, 1-#12 GND	MCC	CHLORINATION CONTROL PANEL	
C-CCP-T	(1) 3/4"	4-#12, 1-#12 GND	TEMPORARY CONTROLS JUNCTION BOX	CHLORINATION CONTROL PANEL	
C-GS-1	(1) 1-1/2"	12-#12, 1-#12 GND	TB-ZSD	CONTROL BUILDING SCADA TERMINATION CABINET	2-#12 FOR DOOR INTRUSION SWITCH SIGNAL, 10-#12 SPARE.
C-MS	(1) 1-1/4"	PULLSTRING (MULETAPE)	CT CABINET	KIUC METER SOCKET	EMPTY CONDUIT WITH PULLSTRING FOR KIUC'S METERING CONDUCTORS.
C-PCVO1	(1) 3/4"	2-#12, 1-#12 GND	WELL PUMP 1 CONTROL J-BOX	WELL PUMP 1 CONTROL VALVE LIMIT SWITCH	LIQUIDTIGHT FLEX CONDUIT.
C-PCVO2	(1) 3/4"	2-#12, 1-#12 GND	WELL PUMP 2 CONTROL J-BOX	WELL PUMP 2 CONTROL VALVE LIMIT SWITCH	LIQUIDTIGHT FLEX CONDUIT.
C-PCVS1	(1) 3/4"	2-#12, 1-#12 GND	WELL PUMP 1 CONTROL J-BOX	WELL PUMP 1 CONTROL VALVE SOLENOID	LIQUIDTIGHT FLEX CONDUIT.
C-PCVS2	(1) 3/4"	2-#12, 1-#12 GND	WELL PUMP 2 CONTROL J-BOX	WELL PUMP 2 CONTROL VALVE SOLENOID	LIQUIDTIGHT FLEX CONDUIT.
C-PDFS1	(1) 3/4"	2-#12, 1-#12 GND	WELL PUMP 1 CONTROL J-BOX	WELL PUMP 1 DISCHARGE FLOW SWITCH	LIQUIDTIGHT FLEX CONDUIT.
C-PDFS2	(1) 3/4"	2-#12, 1-#12 GND	WELL PUMP 2 CONTROL J-BOX	WELL PUMP 2 DISCHARGE FLOW SWITCH	LIQUIDTIGHT FLEX CONDUIT.
C-PLFS1	(1) 3/4"	2-#12, 1-#12 GND	WELL PUMP 1 CONTROL J-BOX	WELL PUMP 1 PRE-LUBE FLOW SWITCH	LIQUIDTIGHT FLEX CONDUIT.
C-PLFS2	(1) 3/4"	2-#12, 1-#12 GND	WELL PUMP 2 CONTROL J-BOX	WELL PUMP 2 PRE-LUBE FLOW SWITCH	LIQUIDTIGHT FLEX CONDUIT.
C-PLS1	(1) 3/4"	2-#12, 1-#12 GND	WELL PUMP 1 CONTROL J-BOX	WELL PUMP 1 PRE-LUBE SOLENOID	LIQUIDTIGHT FLEX CONDUIT.
C-PLS2	(1) 3/4"	2-#12, 1-#12 GND	WELL PUMP 2 CONTROL J-BOX	WELL PUMP 2 PRE-LUBE SOLENOID	LIQUIDTIGHT FLEX CONDUIT.
C-RTU82-1	(1) 1-1/4"	32-#14, 1-#14 GND	SCADA TERMINATION CABINET	RTU 82	16-DI BETWEEN SCADA TERMINATION CABINET AND RTU 82. TIE IN TO EXISTING CONDUIT.
C-RTU82-2	(1) 1-1/4"	32-#14, 1-#14 GND	SCADA TERMINATION CABINET	RTU 82	3-DI, 6-DO BETWEEN SCADA TERMINATION CABINET AND RTU 82. 14-#14 SPARE. TIE IN TO EXISTING CONDUIT.
C-RTU-T	(1) 2"	50-#14, 1-#14 GND	TEMPORARY MCC	RTU 82	DI/DO BETWEEN TEMPORARY MCC AND RTU 82. SCHEDULE 80 PVC CONDUIT ROUTED ABOVEGRADE. 4-#14 SPARE.
C-STC-1	(1) 2"	50-#14, 1-#14 GND	MCC	SCADA TERMINATION CABINET	DI/DO BETWEEN MCC AND RTU 82.
C-STC-2	(1) 2"	SPARE	MCC	SCADA TERMINATION CABINET	
C-WP1-1	(1) 1-1/2"	14-#12, 1-#12 GND	MCC	PUMP 1 CONTROLS JUNCTION BOX	4-#12 SPARE. COIL SPARE WIRING IN PUMP CONTROL JUNCTION BOX.
C-WP1-T	(1) 1"	10-#12, 1-#12 GND	TEMPORARY MCC	PUMP 1 CONTROLS JUNCTION BOX	SCHEDULE 80 PVC CONDUIT ROUTED ABOVEGRADE.
C-WP2-1	(1) 1"	16-#12, 1-#12 GND	MCC	PUMP 2 CONTROLS JUNCTION BOX	PARTIAL EXISTING CONDUIT RUN. VERIFY EXISTING CONDUIT IS SIZED APPROPRIATELY. 4-#12 SPARE. COIL SPARE WIRING IN PUMP CONTROL JUNCTION BOX.
C-WP2-2	(1) 3/4"	2-#12, 1-#12 GND	PUMP 2 CONTROLS JUNCTION BOX	PUMP 2 MOTOR	MOTOR WINDING TEMPERATURE SWITCH
C-WP2-T	(1) 1"	10-#12, 1-#12 GND	TEMPORARY MCC	PUMP 2 CONTROLS JUNCTION BOX	
C-ZSA	(1) 3/4"	2-#14, 1-#14 GND	ZS-A JUNCTION BOX	SCADA TERMINATION CABINET	
C-ZSB	(1) 3/4"	2-#14, 1-#14 GND	ZS-B JUNCTION BOX	SCADA TERMINATION CABINET	
C-ZSC	(1) 3/4"	2-#14, 1-#14 GND	ZS-C JUNCTION BOX	SCADA TERMINATION CABINET	
C-ZSE	(1) 3/4"	2-#14, 1-#14 GND	ZS-E JUNCTION BOX	TB-ZSD	
C-ZSF	(1) 3/4"	2-#14, 1-#14 GND	ZS-F JUNCTION BOX	TB-ZSD	
P-CBP1-1	(1) 3/4"	3-#12, 1-#12 GND	MCC	CHLORINE BOOSTER PUMP 1 DISCONNECT SWITCH	
P-CBP1-1T	(1) 3/4"	3-#12, 1-#12 GND	TEMPORARY MCC	CHLORINE BOOSTER PUMP 1 DISCONNECT SWITCH	
P-CBP1-2	(1) 3/4"	3-#12, 1-#12 GND	CHLORINE BOOSTER PUMP 1 DISCONNECT SWITCH	EXISTING CHLORINE BOOSTER PUMP 1	LIQUIDTIGHT FLEX CONDUIT FOR FINAL CONNECTION TO MOTOR.
P-CBP2-1	(1) 3/4"	3-#12, 1-#12 GND	MCC	CHLORINE BOOSTER PUMP 2 DISCONNECT SWITCH	
P-CBP2-1T	(1) 3/4"	3-#12, 1-#12 GND	TEMPORARY MCC	CHLORINE BOOSTER PUMP 2 DISCONNECT SWITCH	
P-CBP2-2	(1) 3/4"	3-#12, 1-#12 GND	CHLORINE BOOSTER PUMP 2 DISCONNECT SWITCH	EXISTING CHLORINE BOOSTER PUMP 2	LIQUIDTIGHT FLEX CONDUIT FOR FINAL CONNECTION TO MOTOR.
P-CCP	(1) 3/4"	2-#12, 1-#12 GND	PNL-A	CHLORINATION CONTROL PANEL	
P-GEC-1	(1) 1-1/4"	1-#4/0 BC GND	MAIN SERVICE PANELBOARD	GROUNDING ELECTRODE	SCHEDULE 80 PVC CONDUIT FROM PANELBOARD TO GROUND ROD TEST WELL.
P-GEC-2	(1) 1"	1-#2 BC GND	PNL-B	GROUNDING ELECTRODE	SCHEDULE 80 PVC CONDUIT FROM PANELBOARD TO GROUND ROD TEST WELL.
P-GEC-3	(1) 1-1/4"	1-#4/0 BC GND	MCC	GROUNDING ELECTRODE	SCHEDULE 80 PVC CONDUIT FROM MCC TO GROUND ROD TEST WELL.

CONDUIT SCHEDULE					
CONDUIT TAG	CONDUIT (QTY) SIZE	CONTENTS	FROM	TO	NOTES/DESCRIPTION
P-GEC-4	(1) 1"	1-#2 BC GND	PNL-A	GROUNDING ELECTRODE	SCHEDULE 80 PVC CONDUIT FROM PANELBOARD TO GROUND ROD TEST WELL.
P-GTB	(2) 3"	4-#4/0, 1-#2 GND	GENERATOR TERMINAL BOX	MAIN SERVICE PANELBOARD	
P-MCC	(2) 3"	3-#4/0, 1-#2 GND	MAIN SERVICE PANELBOARD	MCC	
P-MCC-T	(2) 3"	3-250 KCML, 1-#2 GND	EXISTING SERVICE PANELBOARD	TEMPORARY MCC	
P-MSP	(2) 3"	4-#4/0, 1-#2 GND	CT CABINET	MAIN SERVICE PANELBOARD	
P-PNLA	(1) 2"	4-#1, 1-#8 GND	MCC	PNL-A	
P-PNLA-T	(1) 1-1/2"	4-#8, 1-#10 GND	TEMPORARY MCC, PNL-T	PNL-A	
P-PNLB	(1) 1-1/2"	4-#8, 1-#10 GND	PNL-A	GENERATOR SHELTER, PNL-B	
P-RTU59	(1) 3/4"	2-#12, 1-#12 GND	PNL-A	RTU 59	POWER TO RTU 59. TIE IN TO EXISTING CONDUIT, SPLICE TO EXISTING WIRING.
P-RTU82	(1) 3/4"	2-#12, 1-#12 GND	PNL-A	RTU 82	POWER TO RTU 82. TIE IN TO EXISTING CONDUIT.
P-RTU-T	(1) 1"	2-#12, 1-#12 GND	TEMPORARY MCC	RTU 82	TEMPORARY POWER TO RTU 82.
P-SVC	(2) 3"	4-#4/0	KIUC TRANSFORMER	CT CABINET	TERMINATION OF CONDUCTORS BY KIUC.
P-WP1-1	(1) 2-1/2"	3-#4/0, 2-#12, 1-#4 GND, 1-#12 GND	MCC	PUMP 1 DISCONNECT SWITCH	
P-WP1-1T	(1) 2-1/2"	3-#4/0, 2-#12, 1-#4 GND, 1-#12 GND	TEMPORARY MCC	EXISTING PUMP 1 DISCONNECT SWITCH	
P-WP1-2	(1) 2-1/2"	3-#4/0, 1-#4 GND	PUMP 1 DISCONNECT SWITCH	PUMP 1 MOTOR	LIQUIDTIGHT FLEX CONDUIT.
P-WP1-2T	(1) 2-1/2"	3-#4/0, 1-#4 GND	EXISTING PUMP 1 DISCONNECT SWITCH	PUMP 1 MOTOR	INSTALL NEW WIRING IN EXISTING LIQUIDTIGHT FLEX CONDUIT.
P-WP1-3	(1) 3/4"	2-#12, 1-#12 GND	PUMP 1 DISCONNECT SWITCH	PUMP 1 MOTOR HEATER	LIQUIDTIGHT FLEX CONDUIT.
P-WP1-3T	(1) 3/4"	2-#12, 1-#12 GND	EXISTING PUMP 1 DISCONNECT SWITCH	PUMP 1 MOTOR HEATER	INSTALL NEW WIRING IN EXISTING LIQUIDTIGHT FLEX CONDUIT.
P-WP2-1	(1) 2-1/2"	3-#4/0, 2-#12, 1-#4 GND, 1-#12 GND	MCC	PUMP 2 DISCONNECT SWITCH	PARTIAL EXISTING CONDUIT RUN.
P-WP2-1T	(1) 2-1/2"	3-#4/0, 2-#12, 1-#4 GND, 1-#12 GND	TEMPORARY MCC	EXISTING PUMP 2 DISCONNECT SWITCH	
P-WP2-2	(1) 2-1/2"	3-#4/0, 1-#4 GND	PUMP 2 DISCONNECT SWITCH	PUMP 2 MOTOR	LIQUIDTIGHT FLEX CONDUIT.
P-WP2-2T	(1) 2-1/2"	3-#4/0, 1-#4 GND	EXISTING PUMP 2 DISCONNECT SWITCH	PUMP 2 MOTOR	INSTALL NEW WIRING IN EXISTING LIQUIDTIGHT FLEX CONDUIT.
P-WP2-3	(1) 3/4"	2-#12, 1-#12 GND	PUMP 2 DISCONNECT SWITCH	PUMP 2 MOTOR HEATER	LIQUIDTIGHT FLEX CONDUIT.
P-WP2-3T	(1) 3/4"	2-#12, 1-#12 GND	EXISTING PUMP 2 DISCONNECT SWITCH	PUMP 2 MOTOR HEATER	INSTALL NEW WIRING IN EXISTING LIQUIDTIGHT FLEX CONDUIT.
S-FIT	(1) 1"	2-1PR#16SH	FLOW TRANSMITTER PANEL	SIGNAL JUNCTION BOX	WELL PUMP 1 AND WELL PUMP 2 FLOW TO RTU 82.
S-RTU82	(1) 1-1/4"	4-1PR#16SH	SIGNAL JUNCTION BOX	RTU 82	WELL 1 AND WELL 2 LEVEL AND WELL PUMP 1 AND WELL PUMP 2 FLOW TO RTU 82. TIE IN TO EXISTING CONDUIT.
S-W10	(1) 3/4"	1-1PR#16SH	WELL 1 LEVEL TRANSMITTER W10	SIGNAL JUNCTION BOX	WELL 1 LEVEL TO RTU 82. LIQUIDTIGHT FLEX CONDUIT BETWEEN TRANSMITTER AND JUNCTION BOX.
S-W20	(1) 3/4"	1-1PR#16SH	WELL 2 LEVEL TRANSMITTER W20	SIGNAL JUNCTION BOX	WELL 2 LEVEL TO RTU 82. LIQUIDTIGHT FLEX CONDUIT BETWEEN TRANSMITTER AND JUNCTION BOX.
X-GSCB	(4) 2"	SPARE	GENERATOR SHELTER	CONTROL BUILDING	STUB-UP AND CAP AT EACH END.
X-MCC	(2) 4"	SPARE	MAIN SERVICE PANELBOARD	MCC	
X-WP1	(1) 2"	SPARE	MCC	PUMP 1 CONTROLS JUNCTION BOX	

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION WILL BE UNDER MY OBSERVATION.
(OBSERVATION OF CONSTRUCTION AS DEFINED IN CHAPTER 18-115, SUBCHAPTER 1 DEFINITIONS OF THE HAWAII ADMINISTRATIVE RULES, "PROFESSIONAL ENGINEERS, ARCHITECTS, SURVEYORS, AND LANDSCAPE ARCHITECTS.")

BY: *[Signature]* 4/30/20
EXP. DATE

REVISION	DATE	BY	APPROVED

DEPARTMENT OF WATER
COUNTY OF KAUAI

JOB NO. WKK-03

MCC, CHLORINATION FACILITIES - KILAUEA WELLS NO. 1 AND NO. 2
KILAUEA, KAUAI, HAWAII

ELECTRICAL SCHEDULES - 2

DESIGNED BY: COT DRAWN BY: SC CHECKED BY: SH

APPROVED BY: *[Signature]* 3/11/19
MANAGER & CHIEF ENGINEER, DEPARTMENT OF WATER, COUNTY OF KAUAI

SHEET 60 OF 60 SHEETS E-242