



**STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
MAUI DISTRICT**

**SPECIAL PROVISIONS
PROPOSAL, CONTRACT,
BOND AND PLANS**

FOR

**MAUI DISTRICT BASEYARD
OFFICE EXPANSION & RENOVATION, PART 2**

PROJECT NO. HWY-M-03-21, Phase 2

DISTRICT OF WAILUKU

ISLAND OF MAUI

FY 2022

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NOTICE TO BIDDERS
(Chapter 103D, HRS)

The receiving of SEALED BIDS for MAUI DISTRICT BASEYARD OFFICE EXPANSION & RENOVATION, PART 2, PROJECT NO. HWY-M-03-21, Phase 2, will begin as advertised on in HiePRO. Bidders are to register and submit bids through HiePRO only. See the following HiePRO link for important information on registering: <https://hiepro.ehawaii.gov/welcome.html>.

Deadline to submit bids is – October 14, 2022, at 2:00 p.m., Hawaii Standard Time (HST). Bids received after said due date and time shall not be considered.

The scope of work includes but is not limited to the following: replacement of electrical panelboards with new underground conduit connections, replacement of fuel tanks and fueling equipment, replacement of concrete foundation for fuel tanks and equipment, installation of new fuel management controller with underground telecommunication and electrical connections, and abatement of lead-containing paint with testing and air monitoring. The estimated cost of construction is \$1,400,000.

To be eligible for award, bidders must possess a valid State of Hawaii General Engineering “A” and/or General Building “B” license and include all of the required Specialty Contractors licenses at the time of bidding as necessary to complete the work.

The Hawaii Products Preference pursuant to ACT 175, SLH 2009, is applicable to this project. Persons wishing to certify and qualify a product as a Hawaii Product shall submit a Certification for Hawaii Product Preference (SPO) Form 38) to the Department of Transportation (DOT) Contracts office no later than 4:30 p.m., fourteen (14) calendar days prior to the bid opening date. Late submittals for this project will not be reviewed by the DOT. A separate SPO-Form 38 shall be completed and submitted for each product. Forms are available at <http://spo.hawaii.gov/all-forms/>.

A five (5) percent bid adjustment for bidders that are parties to apprenticeship agreements pursuant to Section 103-55.6, Hawaii Revised Statutes (HRS), is applicable to this project.

Compliance with Act 192, SLH 2011 is a requirement for this project whereby a minimum of 80 percent of the bidder's work force on this project must consist of Hawaii residents.

An in-person pre-bid conference is scheduled for September 21, 2022 at 9:00 a.m. HST, at the Highways Division, Maui District Administration Building. All prospective bidders or their representatives (employees) are encouraged to attend, but attendance is not mandatory.

If interested in attending the pre-bid meeting, contact Ty Fukuroku, Project Manager, Highways Division, Maui District at (808) 873-3535, or email at ty.h.fukuroku@hawaii.gov to obtain more information concerning the time, date and location instruction for the pre-bid meeting.

ALL requests for information shall be received in writing via HiePRO prior to the Question Due Date in General Information of the HiePRO solicitation. Questions received after the deadline will not be addressed. Verbal requests for information will not receive a response.

Any protest of this solicitation shall be submitted in writing to the Director of Transportation, in accordance with §103D-701, HRS and §3-126, Hawaii Administrative Rules.

Campaign contributions by State and County Contractors. Contractors are hereby notified of the applicability of Section 11-355, HRS, which states that campaign contributions are prohibited from specified State or county government contractors during the term of the contract if the contractors are paid with funds appropriated by a legislative body. For more information, contact the Campaign Spending Commission at (808) 586-0285.

The Equal Employment Opportunity Regulations of the Secretary of Labor implementing Executive Order 11246, as amended, shall be complied with on this project.

Driving While Impaired (DWI) Education. Hawaii Department of Transportation (HDOT) encourages all organizations contracted with the DOT to have an employee education program preventing DWI. DWI is defined as operating a motor vehicle while impaired by alcohol or other legal or illegal substances. HDOT promotes this type of program to accomplish our mission to provide a safe environment for motorists, bicyclists and pedestrians utilizing our State highways, and expects its contractors to do so as well.

The U.S. Department of Transportation Regulation entitled “Nondiscrimination in Federally-Assisted Programs of the U.S. Department of Transportation,” Title 49, Code of Federal Regulations (CFR),

Part 21 is applicable to this project. Bidders are hereby notified that the Department of Transportation will affirmatively ensure that the contract entered into pursuant to this advertisement will be awarded to the lowest responsible bidder without discrimination on the grounds of race, color, national origin or sex (as directed by 23 CFR Part 200).

For additional information, contact Ty Fukuroku, Project Manager, by phone at 808-873-3535, by fax at 808-873-3544 or email at ty.h.fukuroku@hawaii.gov address.

The State reserves the right to reject any or all proposals and to waive any defects in said proposals for the best interest of the public.



JADE T. BUTAY
Director of Transportation

Posted:

SECTION 00210 - INSTRUCTIONS TO BIDDERS

PART 1 - GENERAL

1.01 GENERAL

- A. Only bidders with the required Contractor's license(s) are eligible to submit a Bid.
- B. Bidders (Contractors) shall be incorporated or organized under the laws of the State or be registered to do business in the State as a separate branch or division that is capable of fully performing under the contract. The following definitions are used in the solicitation documents.
 1. Hawaii Business §3-122-112 HAR: A bidder who is registered and incorporated or organized under the laws of the State is a "Hawaii Business" and eligible for an award.
 2. Compliant non-Hawaii Business §3-122-112 HAR: A bidder not incorporated or organized under the laws of the State, but is registered to do business in the State and complies with or is exempt from the requirements of §3-122-112 HAR, is a "Compliant Non-Hawaii Business" and eligible for an award.
 3. Non-compliant Bidder: If a bidder is a non-Hawaii business and is not registered with the DCCA Business Registration Division (BREG) or cannot comply with §3-122-112 HAR, then the bidder is non-compliant and is ineligible for an award.
- C. When announced by the NOTICE TO BIDDERS, all bidders who intend to submit a bid, are invited to attend an initial pre-bid meeting and the accompanying site visit(s). Other interested parties may attend the initial pre-bid meeting and the accompanying site visit(s). For other site visits not conducted by the Department, bidders shall contact and make arrangements with the Project Contact Person listed in SECTION 00800 - SPECIAL CONDITIONS of these specifications.
- D. Bidders shall submit the "Solicitation, Offer and Contract Form", bid bond (if required), and any other documents required by these solicitation documents.
- E. The GENERAL CONDITIONS set forth additional terms and conditions for the bid and award process. The GENERAL CONDITIONS will be part of the contract documents by which the State and the bidder (prospective Contractor) will be bound. Bidders are directed to the GENERAL CONDITIONS, for contract and statutory requirements and for Bidding and Execution of Contract Requirements. Bidders are also directed to SECTION 00700 - GENERAL CONDITIONS and SECTION 00800 - SPECIAL CONDITIONS of these specifications for definitions and modifications to the GENERAL CONDITIONS.
- F. Wherever the term "Comptroller" appears in the Contract Documents, it shall be replaced with the term "Director of Transportation."
- G. The terms "Solicitation, Offer and Contract Form" and "Proposal and Proposal Schedule" are synonymous in the Contract Documents.

1.02 OFFEROR(S) or BIDDER(S)

- A. The terms "Offeror" and "Bidder" are synonymous when used in this Section 00210 and other solicitation documents.

1.03 PRE-BID MEETING AND SITE VISIT(S)

A. General

1. The attendance of pre-bid meetings and site visits is strongly encouraged.
2. Failure to attend the pre-bid meeting(s) and site visit(s) for a project DOES NOT absolve the bidder from its responsibilities under section 2.4.1 of the DAGS Interim General Conditions.
3. Verbal responses and discussions may occur during the course of the pre-bid meeting or site visit and shall not be considered to alter any information in the solicitation documents (see Section 2.5.1 of the DAGS Interim General Conditions).

B. Mandatory Pre-bid Meetings and Site Visits

1. The Project Coordinator may require all prospective bidder/offers to attend a mandatory Pre-bid Meeting(s) and Site Visit(s).
2. All bidders/offers will be required to sign the attendance sheet.
3. Failure to attend mandatory pre-bid meetings and site visits, if required, will automatically be cause for rejection of the bid.

1.04 ADDENDA AND CLARIFICATIONS

- A. The Department may periodically issue addenda and bid clarifications which may provide additional information or alter the plans and specifications.
- B. The Department will make addenda and bid clarifications available to Bidders via HlePRO. Bidders are responsible for the information contained in the addenda and bid clarifications whether or not the bidder receives the addenda or clarifications.
- C. Bidders discovering an ambiguity, inconsistency, or error when examining the bid documents or the site and bidders with questions or clarification requests shall transmit said discoveries, questions, and/or requests via HlePRO prior to the Question Due Date in General Information of the HlePRO Solicitation.
- D. All transmittals shall be brief, concise, but complete enough to properly evaluate and determine the merits of the question or request. Include references to appropriate section numbers, paragraphs, drawings, details, schedule numbers, and provide other information as appropriate.
- E. Requests transmitted or otherwise communicated directly to the Consultant will not be considered to be transmitted to the Department and will not be addressed.
- F. Requests for Substitution will only be entertained prior to bid opening if Section 00800 - SPECIAL CONDITIONS indicates that substitutions before award are allowed for this project. If allowed, requests of this nature must be submitted before the deadline specified for this purpose in the Notice to Bidders.

1.05 SOLICITATION, OFFER AND CONTRACT FORM (BID FORM)

- A. Bidder shall fill out the "Solicitation, Offer and Contract Form" completely. Write in ink or type. Bidders must also comply with the supplemental instructions contained within the "Solicitation, Offer and Contract Form." Do not alter the "Solicitation, Offer and Contract Form", and maintain the form intact. When the State makes changes to the "Solicitation, Offer and Contract Form", a completely new bid form with appropriate addendum notation will be issued. Bidders shall use the most current version. Bidders shall use their exact legal name as registered with the Department of Commerce and Consumer Affairs, if applicable; and to indicate exact legal name in the appropriate space on the Solicitation, Offer and Contract Form.
- B. Hawaii Product Preference:
1. In accordance with ACT 175, SLH 2009, the Hawaii products preference is applicable to this solicitation. Hawaii Products are available for those items noted on the offer form.
 2. The Hawaii products list is available on the SPO webpage at: <https://spo.hawaii.gov/for-vendors/hawaii-product-preferences/>.
 3. Offeror offering a Hawaii Product (HP) shall identify the HP on the solicitation offer page(s). Any person desiring a Hawaii product preference shall have the product(s) certified and qualified if not currently on the Hawaii 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.
 4. Persons desiring to qualify their product(s) not currently on the Hawaii product list shall complete form SPO-38, Certification for Hawaii Product Preference and submit to the Procurement Officer, and provide all additional information required by the Procurement Officer. For each product, one form shall be completed and submitted (i.e. 3 products should have 3 separate forms completed). Form SPO-38 is available on the SPO webpage at: <https://spo.hawaii.gov/all-forms/>.
 5. 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.
 6. Change in availability of Hawaii product. In the event of any change that materially alters the offeror's ability to supply Hawaii products, the offeror shall immediately notify the procurement officer in writing and the parties shall enter into discussions for the purposes of revising the contract or terminating the contract for convenience.

C. Apprenticeship Agreement Preference:

1. If applicable to this project, any bidder seeking the preference must be a party to an apprenticeship agreement registered with the State Department of Labor and Industrial Relations (DLIR) at the time the bid is submitted for each apprenticeable trade the bidder will employ to construct the project. "Employ" means the employment of a person in an employer-employee relationship.
 - a. The apprenticeship agreement shall be registered with the DLIR and conform to the requirements of Hawaii Revised Statutes Chapter 372.
 - b. Subcontractors do not have to be a party to an apprenticeship agreement for the bidder to obtain the preference.
 - c. The bidder is not required to have apprentices in its employ at the time the bid is submitted to qualify for the preference.
2. Self-Certification. A bidder seeking the preference must identify each apprenticeable trade the bidder will employ to perform the work by completing the self certification in the solicitation, offer and contract form. "Apprenticeable trade" shall have the same meaning as "apprenticeable occupation" pursuant to Hawaii Administrative Rules (HAR) §12-30-5.
3. The certification of bidder's participation (Form 1)
 - a. The Certification of Bidder's Participation - Form 1 shall be authorized by an apprenticeship sponsor listed on the DLIR list of registered apprenticeship programs. "Sponsor" means an operator of an apprenticeship program and in whose name the program is approved and registered with the DLIR pursuant to HAR §12-30-1.
 - b. The authorization shall be an original signature by an authorized official of the apprenticeship sponsor.
 - c. The completed Certification of Bidder's Participation - Form 1 for each trade must be submitted with the bid. A facsimile or copy is acceptable to be submitted with the bid, however the signed original must be submitted within five (5) working days of the bid open date. If the signed original is not received within this timeframe, the preference may be denied. Previous certifications shall not apply.
 - d. When filling out the Certification of Bidder's Participation - Form 1, the 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. "Registered apprenticeship program" means a construction trade program approved by and registered with the DLIR pursuant to HAR §12-30-1 and §12-30-4.
 - e. The Certification of Bidder's Participation - Form 1 and the List of Construction Trades in Registered Apprenticeship Programs is available on the DLIR website at: <http://labor.hawaii.gov/wdd/files/2012/12/Form-1-Certification-of-Bidders-Participation.pdf>.

4. Upon receiving the Self Certification and Certification of Bidder's Participation - Form 1, the Procurement Officer will verify that the apprenticeship program is on the List of Construction Trades in Registered Apprenticeship Programs and that the form is signed by an authorized official of the Apprenticeship Program Sponsor. If the programs and signature are not confirmed by the DLIR, the bidder will not qualify for the preference.
 5. If the bidder is certified to participate in an apprenticeship program for each trade which will be employed by the bidder for the project, a preference will be applied to decrease the bidder's bid amount by five (5) percent for evaluation purposes.
 6. Should the bidder qualify for other preferences (for example, Hawaii Products), all applicable preferences shall be applied to the bid price.
- D. Other Conditions: Bidder acknowledges and agrees to the provisions and certifications stated in this article.
- E. Receipt of Addenda: Bidder shall fill in the appropriate dates any addenda were received.
- F. Listing Joint Contractors or Subcontractors:
1. 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's licenses that are required to complete the project. 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.
 2. Bidder agrees the completed listing of joint Contractors or Subcontractors is required for the project and that the bidder, together with the listed joint Contractors and Subcontractors, have all the specialty Contractor's licenses to complete the work.
 3. Based on the Hawaii Supreme Court's January 28, 2002 decision in Okada Trucking Co., Ltd. v. Board of Water Supply, et al., 97 Hawaii 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' or '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.
 4. General Engineering 'A' Contractors automatically have these 'C' specialty Contractor's licenses: C-3, C-9, C-10, C-17, C-24, C-31a, C-32, C-35, C-37a, C-37b, C-38, C-43, C-49, C-56, C-57a, C-57b, and C-61.

5. General Building 'B' Contractors automatically have these 'C' specialty Contractor's licenses: C-5, C-6, C-10, C-12, C-24, C-25, C-31a, C-32a, C-42a, and C-42b.
6. Instructions to complete the Joint Contractors or Subcontractors List:
 - a. Describe the specialty Contractor's nature of work to be performed for this project and provide the complete firm name of the joint Contractor or Subcontractor in the respective columns.
 - b. List only one entity per required specialty contractor's classification. A bidder who intends to use more than one entity with the same specialty contractor's classification, will not be permitted to do so unless the nature of work to be performed by each entity is both distinct and separate and is appropriately described (i.e. two C-13 contractors are listed but one has the responsibility for AC control and the other for AC power). A bidder who intends to perform work that falls under the same specialty contractor's classification as that of a listed joint contractor or subcontractor must list itself, ensure that the nature of work is both distinct and separate, and is appropriately described.
- G. Proposal Schedule: Bidders must complete all unit prices and amounts, then enter the TOTAL AMOUNT FOR COMPARISON OF BIDS. Refer to Bidder's Instructions located within the article.
 1. The bidder is directed to the CONTRACT TIME information in the "Solicitation, Offer and Contract Form" for the contract duration and construction time. Bidder shall refer to SECTION 01100 - PROJECT REQUIREMENTS of these specifications for additional construction time information, as applicable.

1.06 EVALUATION CRITERIA

- A. Evaluating Bids: The lowest responsive, responsible bid is determined by the following procedures:
 1. Chapter 103D, HRS, which provides for the preferences, shall apply.
 2. The total lump sum bid price is adjusted to reflect the applicable preferences.
 3. The project will be evaluated based on the adjusted bid price.

1.07 METHOD OF AWARD

- A. The contract will be awarded to the lowest responsive and responsible Bidder whose bid meets the requirements and criteria set forth in the solicitation documents and as determined by the Comptroller.
- B. In the event the total lump sum bid of all bidders exceeds the project control budget, the Department reserves the right to make an award to the apparent Low Bidder if additional funds are available or by reducing the scope of work through negotiation.

1.08 OTHER CONDITIONS FOR AWARD

- A. The Comptroller may reject any or all bids and waive any defects if the Comptroller believes the rejection or waiver is in the best interest of the State.

- B. The Comptroller may hold all bids up to 60 calendar days from the date bids were opened. Unless otherwise required by law, bids may not be withdrawn without penalty.
- C. The award of the contract is conditioned upon funds made available for the project (or projects if applicable).
- D. Any agreement or contract is subject to approval by the Department of the Attorney General, and the approval of the Governor, as required by statute, regulation, rule, order, or other directive.

1.09 RESPONSIBILITY OF AWARDED BIDDER

- A. Pursuant to Section 103D-310(c), HRS, the responsive bidder recommended for contract award, if any, shall be compliant with all laws governing entities doing business in the State including the following chapters:
 - 1. Chapter 237, tax clearance;
 - 2. Chapter 383, unemployment insurance;
 - 3. Chapter 386, workers' compensation;
 - 4. Chapter 392, temporary disability insurance;
 - 5. Chapter 393, prepaid health care; and
 - 6. Chapter 103D-310(c), Certificate of Good Standing (COGS) for entities doing business in the State.
- B. The State will verify compliance on Hawaii Compliance Express (HCE). The HCE is an electronic system that allows vendors/contractors/service providers doing business with the State to quickly and easily obtain proof that they are compliant with applicable laws. The HCE certificate, 'Certificate of Vendor Compliance', allows this single printable electronic certificate to be substituted for the tax clearance, labor certificate, and a Certificate of Good Standing required in Hawaii Revised Statutes (HRS), Section 103D-310(c), and Hawaii Administrative Rules (HAR), Section 3-122-112. The HCE provides compliance status in real time.
- C. Bidders are advised to register with Hawaii Compliance Express at <https://vendors.ehawaii.gov> before submitting an offer. Bidders are strongly encouraged to submit a 'Certificate of Vendor Compliance' with their bid package to ensure the State's ability to quickly verify compliance at the time of award. If an offeror is not compliant at the time of award, an otherwise responsive and responsible offeror may not receive the award.

1.10 PRE-CONSTRUCTION MEETING

- A. General
 - 1. The attendance of pre-construction meetings is required.
 - 2. The contractor will be required to sign the attendance sheet.

PART 2 - PRODUCTS (Not Used)

PART 3- EXECUTION (Not Used)

END OF SECTION

SOLICITATION, OFFER AND CONTRACT FORM
TO THE STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PROJECT: MAUI DISTRICT BASEYARD OFFICE
EXPANSION & RENOVATION, PART 2
ISLAND OF MAUI

PROJECT NO: HWY-M-03-21, Phase 2

CONTRACT TIME: Twelve (12) months from date indicated in the
Notice to Proceed from the Department.

LIQUIDATED DAMAGES: Refer to GENERAL CONDITIONS, Article 7 -
Prosecution and Progress, Section 7.26, Failure
to Complete the Work on Time, Section 7.32,
Project Acceptance Date and Section 7.33, Final
Settlement of Contract.

**NOTE: PERFORMANCE AND PAYMENT BONDS
ARE REQUIRED FOR THIS PROJECT.**

Director of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Sir:

The undersigned bidder declares the following:

1. It has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with this proposal.
2. It has not been assisted or represented on this matter by any individual who has, in a State capacity, been involved in the subject matter of this contract within the past two years.
3. It has not and will not, either directly or indirectly offered or given a gratuity (i.e., an entertainment or gift) to any State or County employee to obtain a contract or favorable treatment under a contract.

The undersigned bidder further agrees to the following:

1. If this proposal is accepted, it shall execute a contract with the Department to provide all necessary labor, machinery, tools, equipment, apparatus and any other means of construction, to do all the work and to furnish all the materials specified in the contract in the manner and within the time therein prescribed in the contract, and that it shall accept in full payment therefore the sum of the unit and/or lump sum prices as set forth in the attached proposal schedule for the actual quantities of work performed and materials furnished and furnish satisfactory security in accordance with Section 103D-324, Hawaii Revised Statutes, within 10 days after the award of the contract or within such time as the Director of Transportation may allow after the undersigned has received the contract documents for execution, and is fully aware that non-compliance with the aforementioned terms will result in the forfeiture of the full amount of the bid guarantee required under Section 103D-323, Hawaii Revised Statutes.
2. That the quantities given in the attached proposal schedule are approximate only and are intended principally to serve as a guide in determining and comparing the bids.
3. That the Department does not either expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or portion of the work, or to omit portions of the work, as may be deemed necessary or advisable by the Director of Transportation, and that all increased or

decreased quantities of work shall be performed at the unit prices set forth in the attached proposal schedule except as provided for in the specifications.

- 4. In case of a discrepancy between unit prices and the totals in said Proposal Schedule, the unit prices shall prevail.
- 5. Agrees to begin work within 10 working days after the date of notification to commence with the work, which date is in the notice to proceed, and shall finish the entire project within the time prescribed.
- 6. The Director of Transportation reserves the right to reject any or all bids and to waive any defects when in the Director's opinion such rejections or waiver will be for the best interest of the public.

The bidder acknowledges receipt of and certifies that it has completely examined the following listed items: Interim General Conditions 1999 Edition, the Notice to Bidders, the General Conditions, the Special Conditions, the Solicitation, Offer and Contract Form, the Contract and Bond Forms, and the Project Plans.

In accordance with Section 103D-323, Hawaii Revised Statutes, this proposal is accompanied with a bid security in the amount of 5% of the total amount bid, in the form checked below. (Check applicable bid security submitted with bid.)

_____ Surety Bid Bond (Use standard form),

_____ Cash,

_____ Cashier's Check,

_____ Certified Check, or

(Fill in other acceptable security.)

The undersigned bidder acknowledges receipt of any addendum issued by the Department by recording in the space below the date of receipt.

Addendum No. 1 _____

Addendum No. _____

Addendum No. 2 _____

Addendum No. 4 _____

In accordance with Section 103D-302, Hawaii Revised Statutes, the undersigned as bidder has listed the name of each person or firm, who will be engaged by the bidder on the project as Joint Contractor or Subcontractor and the nature of work to be done by each. It is understood that failure to comply with the aforementioned requirements may be cause for rejection of the bid submitted.

	<u>Name of Subcontractor</u>	<u>Nature and Scope of Work</u>
1.	_____ _____	_____ _____
2.	_____ _____	_____ _____
3.	_____ _____	_____ _____
4.	_____ _____	_____ _____
5.	_____ _____	_____ _____
6.	_____ _____	_____ _____
7.	_____ _____	_____ _____
8.	_____ _____	_____ _____
9.	_____ _____	_____ _____

	<u>Name of Joint contractor</u>	<u>Nature and Scope of Work</u>
1.	_____	_____
	_____	_____
2.	_____	_____
	_____	_____
3.	_____	_____
	_____	_____

("None" or if left blank indicates no Subcontractor or Joint Contractor; if more space is needed, attach additional sheets.)

The undersigned hereby certifies that the bid prices contained in the attached proposal schedule have been carefully checked and are submitted as correct and final.

This declaration is made with the understanding that the undersigned is subject to the penalty of perjury under the laws of the United States and is in violation of the Hawaii Penal Code, Section 710-1063, unsworn falsification to authorities, of the Hawaii Revised Statutes, for knowingly rendering a false declaration.

Bidder

By

Authorized Signature

Title

Business Address

Email Address

Date

Contact Person (If different from above.)

Phone Number and Email Address

NOTE:

If bidder is a CORPORATION, the legal name of the corporation shall be set forth above, the corporate seal affixed, together with the signature(s) of the officer(s) authorized to sign contracts for the corporation. Please attach to this page current (not more than six months old) evidence of the authority of the officer(s) to sign for the corporation.

If bidder is a PARTNERSHIP, the true name of the partnership shall be set forth above, with the signature(s) of the general partner(s). Please attach to this page current (not more than six months old) evidence of the authority of the partner authorized to sign for the partnership.

If bidder is an INDIVIDUAL, the bidder's signature shall be placed above.

If signature is by an agent, other than an officer of a corporation or a partner of a partnership, a POWER OF ATTORNEY must be on file with the Department before opening bids or submitted with the bid. Otherwise, the Department may reject the bid as irregular and unauthorized.

SOLICITATION, OFFER AND CONTRACT FORM
 FOR
 MAUI DISTRICT BASEYARD OFFICE EXPANSION & RENOVATION, PART 2
 PROJECT NO. HWY-M-03-21, Phase 2
 ISLAND OF MAUI

PROPOSAL SCHEDULE

Bid Item No.	Description	Unit Price	Amount
1	General Requirements	Lump Sum	\$ _____
2	Site Preparation – Fuel Station	Lump Sum	\$ _____
3	Repair – Fuel Station Pavement	Lump Sum	\$ _____
4	Repair – Fueling Systems	Lump Sum	\$ _____
5	Electrical Work	Lump Sum	\$ _____
6	Environmental	Lump Sum	\$ _____
7	Hazardous Materials Remediation	Force Account	\$ 60,000
TOTAL AMOUNT FOR COMPARISON OF BIDS (For comparison of bids, sum of Bid Item Nos. 1 through 7)			\$ _____

SOLICITATION, OFFER AND CONTRACT FORM
FOR
MAUI DISTRICT BASEYARD OFFICE EXPANSION & RENOVATION, PART 2
PROJECT NO. HWY-M-03-21, Phase 2
ISLAND OF MAUI

NOTES:

1. Bids shall include all Federal, State, County and other applicable taxes.
2. The TOTAL AMOUNT FOR COMPARISON OF BIDS will be used to determine the lowest responsible bidder.
3. Bidders must complete all unit prices and amounts. Failure to do so may be grounds for rejection of bid.
4. In case of a discrepancy between unit price and the total in said bid, the unit price shall prevail.
5. Completed Solicitation, Offer and Contract Form file shall be uploaded into HlePRO prior to the opening date and time. All other required confidential or proprietary documents shall be uploaded separately, with "confidential" or similar notation, somewhere in the file name.
6. Bids received after the deadline to submit bids shall not be considered.
7. Refer to pages 00410-2 and 00410-3 of the Solicitation, Offer and Contract Form for other conditions that the bidder has to agree with.

PREFERENCES

Bidders agree that preferences shall be taken into consideration to determine the low bidder in accordance with said Sections and the rules promulgated, however, the award of contract will be in the amount of the bid offered exclusive of any preferences.

A. HAWAII PRODUCTS PREFERENCE

It is understood that certain Hawaii Products may be acceptable for use in this project and that, pursuant to Act 192, SLH 2009, which provides preference for Hawaii Products, a bidder proposing to use such Hawaii products shall so designate in the schedule provided below.

If a bidder proposes to use Hawaii Products, the bidder must so designate in said schedule by entering the cost of such product in the appropriate space provided. Failure on the part of the bidder to designate the use of Hawaii products will automatically void any preference for that product.

Persons desiring to qualify product(s) not currently on the list, shall complete form SPO-38, *Certification for Hawaii Product Preference* in accordance with the Special Provisions of these specifications.

It is understood by the bidder that if the bidder elects to furnish qualified Hawaii Products, and is awarded the contract, then fails to use such products or meet the requirements of such preference, the bidder shall be subject to the statutory penalties, provided in Section 103D-1002, Hawaii Revised Statute, and such other remedies as may be available to the State.

() Yes, I propose to use Hawaii Products and claim the Hawaii Products Preference. I have filled in the table on the following pages as applicable.

B. APPRENTICESHIP PROGRAMS PREFERENCE

In accordance with ACT 17, SLH 2009 – Apprenticeship Program, a 5% bid adjustment for bidders that are parties to apprenticeship agreements pursuant to Hawaii Revised Statutes (HRS) Section 103-55.6 may be applied to the bidder's price for evaluation purposes

Any bidder seeking this preference must be a party to an apprenticeship agreement registered with the Department of Labor and Industrial Relations at the time the offer is made for each apprenticeable trade the bidder will employ to construct the public works projects for which the offer is being made.

The bidder is responsible for complying with all submission requirements for registration of its apprenticeship program before requesting the preference.

() Yes, I wish to be considered for the Apprenticeship Programs Preference. I have included Certification Form(s) 1 with my bid.

C. RECYCLED PRODUCT PREFERENCE

Recycled product preference shall not apply to this proposal.

DESIGNATION OF APPROVED HAWAII PRODUCTS* TO BE USED
***CONSTRUCTION PRODUCTS AND SOIL AMENDMENTS/PRODUCTS**

Product Category	Product Subcategory as applicable	Manufacturer	Cost FOB Jobsite, Unloaded Including Applicable General Excise & Use Taxes (a)	10% (b)	Credit (a) x (b)
Aggregates – Basaltic Termite Barrier		Ameron International Corporation (Oahu)(Maui)	\$		\$
		HC&D LLC (Oahu)	\$		\$
Aggregates and Sand – Basalt, Rock, Cinder, Limestone and Coral		Ameron International Corporation (Oahu)(Maui)	\$		\$
		Delta Construction Corporation (Oahu)	\$		\$
		Edwin Deluz Trucking & Gravel LLC (Hawaii)	\$		\$
		Goodfellow Bros, Inc. (All Islands)	\$		\$
		Grace Pacific (Oahu)	\$		\$
		GW Construction (Hawaii)	\$		\$
		Hawaiian Cement (Oahu) (Maui)	\$		\$
		Jas. W. Glover, Ltd. (Hawaii) (Kauai)	\$		\$
		Kauai Aggregates (Kauai)	\$		\$
		HC&D LLC (Oahu) (Maui)	\$		\$
		Puna Rock Co., LTD. (Hawaii)	\$		\$
		Sanford’s Service Center, Inc. (Oahu) (Maui) (Hawaii) (Kauai)	\$		\$
		Sphere, LLC (Oahu)	\$		\$
		Tileco, Inc. (Oahu) (Hawaii) (Maui) (Kauai)	\$		\$
		Tri-L Construction, Inc. (Molokai)	\$		\$
West Hawaii Concrete (Hawaii)	\$		\$		
Yamada and Sons, Inc. (Hawaii)	\$		\$		
Aggregates – Recycled Asphalt and Concrete		Glover Honsador (Kauai)	\$		\$
		Grace Pacific (Oahu)	\$		\$
		Jas. W. Glover, Ltd. (Hawaii) (Oahu)	\$		\$
		West Oahu Aggregate Co. Inc. (Oahu)	\$		\$

Asphalt and Paving Materials	Ala Imua LLC (Oahu)	\$	\$
	Black Maui Rose LLC (Maui)	\$	\$
	Black Plumeria LLC (Oahu)	\$	\$
	GP Roadway Solutions, Inc. (All Islands)	\$	\$
	Grace Pacific Corporation (Hawaii) (Oahu) (Kauai)	\$	\$
	Halawa Asphalt LLC (Oahu)	\$	\$
	Hawaii Emulsion, Inc. (All Islands)	\$	\$
	Jas. W. Glover, Ltd. (Hawaii) (Kauai)	\$	\$
	Maui Asphalt X-IV, LLC (Maui) (Molokai)(Kauai)	\$	\$
	Maui Paving LLC (Maui) (Molokai)	\$	\$
	Road and Highway Builders (Oahu)	\$	\$
	Walker-Moody Pavement Products & Equipment (All Islands)	\$	\$
	Yamada and Sons, Inc. dba YS Rock and Con-Agg of Hawaii (Hawaii)	\$	\$
	Cement and Concrete Products	Ameron International Corporation (Oahu) (Maui)	\$
BOMAT, Ltd. (All Islands)		\$	\$
Glover Honsador (Kauai)		\$	\$
Hawaiian Cement (Oahu)(Maui)		\$	\$
Island Ready Mix Concrete, Inc. (Oahu)		\$	\$
Jas. W. Glover, Ltd. (Hawaii)(Kauai)		\$	\$
Jensen Enterprises (All Islands)		\$	\$
Kiewit Infrastructure West Co. (Oahu)		\$	\$
Kohala Coast Concrete & Precast LLC (Hawaii)		\$	\$
HC&D LLC (Oahu) (Maui)		\$	\$
O. Thronas, Inc. (Kauai)		\$	\$
Road and Highway Builders, LLC (Oahu)		\$	\$
Tileco, Inc. (Oahu)(Hawaii)(Maui)(Kauai)		\$	\$
Tri-L Construction, Inc. (Molokai)		\$	\$
West Hawaii Concrete (Hawaii)	\$	\$	
Yamada and Sons, Inc. (Hawaii)	\$	\$	

Precast Concrete Products		Aloha Precast, Inc. (All Islands)	\$	\$
		Ameron International Corporation (Oahu)	\$	\$
		GPRM Prestress LLC (All Islands)	\$	\$
		Hawaii Concrete Products, Inc. (Oahu)	\$	\$
		Hawaii Precast, Inc. (All Islands)	\$	\$
		Kohala Coast Concrete & Precast LLC (Hawaii)	\$	\$
		Ramtek Fabrication Co., Inc. (All Islands)	\$	\$
		Walker Industries, Ltd. (Oahu)(Hawaii)(Maui)(Kauai)	\$	\$
Environmental Sewage – Treatment Innovative System (ESIS)	Septic Tanks	Ameron International Corporation (Oahu)	\$	\$
		Environmental Waste Management Systems, Inc. (Oahu)(Hawaii)(Maui)(Kauai)	\$	\$
		Walker Industries, Ltd. (All Islands)	\$	\$
Hot Dip Galvanizing		Universal Associates, Inc. (Oahu)	\$	\$
Metal Roofing and Flashing – Preformed		HPM Building Supply (All Islands)	\$	\$
Pipes – Aluminum and Galvanized	Pipes – Misc.	Ameron International Corporation (Oahu)	\$	\$
Aluminum Floating Dock – Misc.		Bluewater Marine and Dock Specialties (All Islands)	\$	\$
		High Seas Welding LLC dba JS Marine (All Islands)	\$	\$
Signs – Traffic, Regulatory & Construction		GP Roadway Solutions, Inc. (All Islands)	\$	\$
		Safety Systems and Signs Hawaii, Inc. (All Islands)	\$	\$
Veneer		Big Rock Manufacturing (All Islands)	\$	\$

Soil Amendments, Mulch, Compost		Eko Systems Inc. (Oahu) (Maui) (Hawaii)(Kauai)	\$	\$
		Hawaiian Earth Recycling LLC (All Islands)	\$	\$
		Island Topsoil LLC (All Islands)		
		Kauai Nursery & Landscaping, Inc. (All Islands)	\$	\$
		Molokai Seed Co. (All Islands)	\$	\$
	Sanford's Service Center, Inc. (Hawaii)	\$	\$	
Compost Filter		EnviroTech BioSolutions Hawaii, Inc. (All Islands)	\$	\$
		Certified Erosion Control Hawaii LLC (All Islands)	\$	\$
TOTAL			\$	\$

END OF SECTION

SECTION 00700 – GENERAL CONDITIONS

PART 1 – GENERAL

1.01 GENERAL CONDITIONS

- A. The publication by the Public Works Division, Department of Accounting and General Services, State of Hawaii, titled "INTERIM GENERAL CONDITIONS 1999 Edition," known as the "GENERAL CONDITIONS", forms part of the State of Hawaii Contract between the Contractor and the State of Hawaii. The GENERAL CONDITIONS are not physically included with these specifications, but are included by reference. Copies of the GENERAL CONDITIONS may be obtained from the Department of Accounting and General Services, Public Works Division, Oahu Office, State of Hawaii, fourth floor of the Kalanimoku Building, Room 422, 1151 Punchbowl Street, Honolulu, Hawaii or at the DAGS District Offices on Kauai, Maui and Hawaii, or on the Public Works website at: <https://pwd.hawaii.gov/wp-content/uploads/2014/12/InterimGeneralConditions1999Edition.pdf>
- B. The GENERAL CONDITIONS and SECTION 00800 – SPECIAL CONDITIONS shall govern the Work specified in all DIVISIONS and SECTIONS.
- C. Wherever the term "Interim General Conditions" appears in the Contract Documents, it shall be replaced with the term "GENERAL CONDITIONS."
- D. Wherever the term "Comptroller" appears in the Contract Documents, it shall be replaced with the term "Director of Transportation."

1.02 REVISIONS TO THE GENERAL CONDITIONS - The following changes shall govern over the respective items in the published "INTERIM GENERAL CONDITIONS, 1999 Edition."

- A. Under ARTICLE 1 - DEFINITIONS, replace existing sections (1.4, 1.5, 1.9, 1.11, 1.12, 1.18, 1.24, 1.28, 1.37, 1.43, 1.44, 1.49 and 1.50 respectively) and add new sections (1.65 through 1.76 respectively):
 - "1.4 **ADMINISTRATOR** – The State of Hawaii, Department of Transportation (HDOT), Highways Administrator.
 - 1.5 **ADVERTISEMENT** – A public announcement soliciting bids or offers.
 - 1.9 **BID** – See Offer.
 - 1.11 **BIDDER** – See Offeror.
 - 1.12 **BIDDING DOCUMENTS (or SOLICITATION DOCUMENTS)** – The advertisement solicitation notice and instructions, Offer requirements, Offer forms, and the proposed contract documents including all addenda, and clarifications issued prior to receipt of the Offer.

- 1.18 DIRECTOR** – The Director of the HDOT acting directly or through duly authorized representatives.
- 1.24 CONTRACT TIME (or CONTRACT DURATION)** – The number of calendar (or working) days provided for completion of the contract, inclusive of authorized time extensions. The number of days shall begin running on the effective date in the Notice to Proceed. If in lieu of providing a number of calendar (or working) days, the contract requires completion by a certain date, the work shall be completed by that date.
- 1.26 DEPARTMENT** – The Department of Transportation, State of Hawaii (abbreviated HDOT).
- 1.28 ENGINEER** – The District Engineer, acting directly or through his duly authorized representatives, including inspectors provided by state consultants, who are responsible for supervising engineering functions within HDOT, Maui District (HWY-M) operations.
- 1.37 INSPECTOR** – The person assigned by the Contracting Officer to inspect and monitor construction operations.
- 1.43 NOTICE TO CONTRACTORS** – See Solicitation.
- 1.44 NOTICE TO PROCEED** – A written notice from the Department to the Contractor establishing the applicable Contract Duration, Project Start Date, Jobsite Start Date, Jobsite Completion Date, and Contract Completion Date.
- 1.49 PROPOSAL (Bid)** – See Offer (or Bid).
- 1.50 PROPOSAL FORM** – See Offer Form (or Bid Form).
- 1.65 CONTRACTING OFFICER** – See Engineer.
- 1.66 JOBSITE START DATE** – The date when on-site construction may start.
- 1.67 JOBSITE COMPLETION DATE** - The date when on-site construction must be completed.
- 1.68 OFFER (or BID)** – The executed document submitted by an Offeror in response to a solicitation request, to perform the work required by the proposed contract documents, for the price quoted and within the time allotted.
- 1.69 OFFEROR (or BIDDER)** – 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 work or construction contemplated.

- 1.70 OFFER FORM (or BID FORM)** – The form prepared by the Department on which the Offeror submits the written offer or bid. By submitting an offer or bid, the Offeror adopts the language on the form as its own.
- 1.71 PROJECT CONTROL BUDGET** – The amount of funds set aside for the construction of the Project.
- 1.72 PROJECT START DATE** – The date established in the Notice to Proceed when the Contractor shall begin prosecution of the work and the start of contract time.
- 1.73 PROPOSAL SCHEDULE** – The tabulated form of the contract bid items prepared by the Department on which the Offeror submits the written offer or bid. By submitting an offer or bid, the Offeror adopts the language on the form as its own.
- 1.74 RESIDENT** – A person who is physically present in the State of Hawaii at the time the person claims to have established the person's domicile in the State of Hawaii and shows the person's intent is to make Hawaii the person's primary residence.
- 1.75 SHORTAGE TRADE** – A construction trade in which there is a shortage of Hawaii residents qualified to work in the trade as determined by the Department of Labor and Industrial Relations.
- 1.76 SOLICITATION** – An Invitation to Bid or Request for Proposals or any other document issued by the Department to solicit bids or offers to perform a contract. The solicitation may indicate the time and place to receive the bids or offers and the location, nature and character of the work, construction or materials to be provided."

- B. Under ARTICLE 2 - PROPOSAL REQUIREMENTS AND CONDITIONS, modify section 2.1 - QUALIFICATION OF BIDDERS, by deleting 2.1.1, through 2.1.2.8 and substitute the following 2.1.1 through 2.1.2:

"2.1.1 Notice of Intention to Bid

2.1.1.1 In accordance with section 103D-310, Hawaii Revised Statutes, and Section 3-122-111, Hawaii Administrative Rules, a written notice of intention to bid need not be filed for construction of any public building or public work. A written notice of intention to bid need not be filed for mere furnishing and installing of furniture, equipment, appliances, material and any combination of these items when a Contractor's license is not required under Chapter 444 of the Hawaii Revised Statutes, as amended, and the rules and regulations of the Contractor's License Board.

2.1.1.2 If two (2) or more prospective bidders desire to bid jointly as a joint venture on a single project, they must file an affidavit of joint venture. Such affidavit of joint

venture will be valid only for the specific project for which it is filed. No further license is required when all parties to the joint venture possess current and appropriate contractor's licenses. Joint ventures are required to be licensed in accordance with Chapter 444 of the Hawaii Revised Statutes, as amended, and the rules and regulations of the Contractor's License Board when any party to the joint venture agreement does not hold a current or appropriate contractor's license. The joint venture must register with the office of the Director of Commerce and Consumer Affairs in accordance Chapter 425 of the Hawaii Revised Statutes, as amended.

2.1.1.3 No persons, firm or corporation may bid where (1) the person, firm, or corporation, or (2) a corporation owned substantially by the person, firm, or corporation, or (3) a substantial stockholder or an officer of the corporation, or (4) a partner or substantial investor in the firm is in arrears in any payment owned to the State of Hawaii or any of its political subdivisions or is in default of any obligation to the State of Hawaii or to all or to any of its political subdivisions, including default as a surety or failure to perform faithfully and diligently any previous contract with the Department.

2.1.2 Compliance Certificate 103D-310(c), Hawaii Revised Statutes -The Contractors are required to provide proof of compliance in order to receive a contract of \$25,000 or more. To meet this requirement, Bidders may apply and register at the "Hawaii Compliance Express" website:
<http://vendors.ehawaii.gov/hce/splash/welcome.html>"

- C. Under ARTICLE 2 - PROPOSAL REQUIREMENTS AND CONDITIONS, modify section 2.3 – CONTENTS OF PROPOSAL FORMS, by deleting 2.3.1, through 2.3.4 and substitute the following 2.3.1 through 2.3.4:

2.3.1 Prospective bidders will be furnished with proposal forms giving the location, description, and the contract time of the work contemplated for which a lump sum bid price is asked or containing a schedule of items, together with estimated quantities of work to be performed and materials to be furnished, for which unit bid prices and/or lump sum bid prices are asked. The proposal forms will be posted in HlePRO.

2.3.2 All papers bound with or attached to the proposal form shall be considered a part thereof and shall not be detached or altered when the proposal is submitted through HlePRO.

2.3.3 The drawings, specifications and other documents designated in the proposal form, will also be considered a part thereof whether attached or not.

2.3.4 By submitting a bid on the proposal form, a bidder accepts the language therein as its own."

- D. Under ARTICLE 2 - PROPOSAL REQUIREMENTS AND CONDITIONS, modify section 2.6 - SUBSTITUTION OF MATERIALS AND EQUIPMENT BEFORE BID OPENING, by renaming section 2.6 SUBSTITUTION BEFORE CONTRACT AWARD and deleting

subsections 2.6.1, through 2.6.6 and substitute the following three new subsections and related paragraphs 2.6.1 through 2.6.3:

2.6.1 For Substitutions after the Letter of Award is issued; refer to Section 6.3 SUBSTITUTION AFTER CONTRACT AWARD.

2.6.2 Unless specifically required otherwise in the contract documents, Offerors shall not submit products, materials, equipment, articles or systems for review or approval prior to submitting their Offers.

2.6.3 Offerors shall prepare their Offer forms based on the performance requirements of the materials, equipment, articles or systems noted on the drawings and specifications. If trade names, makes, catalog numbers or brand names are specified, Offerors shall infer that these items indicate the quality, style, appearance or performance of the material, equipment, article, or systems to be used in the project."

- E. Under ARTICLE 2 - PROPOSAL REQUIREMENTS AND CONDITIONS, modify section 2.7 - PREPARATION OF PROPOSAL, by deleting subsection 2.7.3 and substituting the following 2.7.3:

2.7.3 Pursuant to the requirements of Section 103D-302, HRS, each Bidder shall include in its bid the name of each person or firm to be engaged by the Bidder on the project as joint contractor or subcontractor indicating also the nature and scope of work to be performed by such joint contractor and/or subcontractor. If the Bidder fails to list a joint contractor or subcontractor, the State may accept the bid if it is in the State's best interest and the value of the work to be performed by the joint contractor or subcontractor is equal to or less than one percent of the total bid amount. The Bidder shall be solely responsible for verifying that their joint contractor or subcontractor has the proper license at the time of the submitted bid."

- F. Under ARTICLE 2 - PROPOSAL REQUIREMENTS AND CONDITIONS, modify section 2.9 - DELIVERY OF PROPOSALS, by deleting subsection 2.9 and substituting the following 2.9:

2.9 Delivery of Proposals - The bidder shall submit the proposal in HlePRO. Bids received after said due date and time shall not be considered. Original bid documents do not have to be submitted. Award will be made based on proposals submitted in HlePRO."

- G. Under ARTICLE 2 - PROPOSAL REQUIREMENTS AND CONDITIONS, modify section 2.10 – WITHDRAWAL OR REVISION OF PROPOSAL, by deleting subsections 2.10.1 and 2.10.2 and substituting the following 2.10.1:

2.10.1 Withdrawal or Revision of Proposals. A bidder may withdraw or revise a proposal after the bidder submits the proposal in HlePRO. Withdrawal or revision of proposal must be completed before the time set for the receiving of bids."

- H. Under ARTICLE 2 - PROPOSAL REQUIREMENTS AND CONDITIONS, modify section 2.13 - PROTEST, by deleting subsections 2.13.2 and 2.13.3 and substituting the following 2.13.2 & 2.13.3:

"2.13.2 No Protest based upon the contents of the solicitation shall be considered unless it is submitted in writing to the HDOT Director prior to the date set for the receipt of proposals.

2.13.3 A protest of an award or proposed award pursuant to §103D-302 or §103D-303, HRS, shall be submitted in writing to the HDOT Director within five (5) working days after the posting of the award of the Contract."

- I. Under ARTICLE 2 - PROPOSAL REQUIREMENTS AND CONDITIONS, modify section 2.13 - PROTEST, by renumbering existing subsection 2.13.4 to 2.13.5 and adding new subsection 2.13.4:

"2.13.4 All protests must be received at the Department of Transportation, Highways Division, Maui District Office (HWY-M) at 650 Palapala Dr, Kahului, Hawaii 96732 by the appropriate deadline. Timely receipt shall be evidenced by the date and time registered by the DOT Highways, Maui District Office time stamp clock.

The Protester bears sole responsibility for ensuring that the protest letter/documentation is delivered by the appropriate deadline."

- J. Under ARTICLE 3 - AWARD AND EXECUTION OF CONTRACT, replace section 3.2.8 with the following:

"3.2.8 Where there is an incomplete or ambiguous listing of joint contractors and/or subcontractors, the offer may be rejected. Bidders are solely responsible to ensure that their subcontractor listing is complete (i.e. all work which is not listed as being performed by joint contractors and/or subcontractors can be performed by the bidder using its license(s)). Additions to the subcontractor listing by the bidder will not be allowed after bid opening. When there is an ambiguity, as determined by HDOT, as to the completeness of the listing, HDOT reserves the right to seek information from the bidder to determine whether, in HDOT's discretion, the listing is an error that may be forgiven."

- K. Under ARTICLE 3 - AWARD AND EXECUTION OF CONTRACT, modify section 3.3 CORRECTION OF BIDS AND WITHDRAWAL OF BIDS 3-122-31 HAR, by deleting subsection 3.3.1.2(b) and substituting the following 3.3.1.2(b):

"(b) Transposition errors;"

- L. Under ARTICLE 3 - AWARD AND EXECUTION OF CONTRACT, modify section 3.3 CORRECTION OF BIDS AND WITHDRAWAL OF BIDS §3-122-31 HAR, by deleting subsection 3.3.2 and substituting the following 3.3.2:

"3.3.2 Withdrawal of bids after bid opening but prior to award may be made when the bid contains a mistake attributable to an obvious error which affects price, quantity,

quality, delivery, or contractual conditions, and the bidder requests withdrawal in writing by submitting proof of evidentiary value which demonstrates that a mistake was made. The Comptroller shall prepare a written approval or denial in response to this request."

- M. Under ARTICLE 3 - AWARD AND EXECUTION OF CONTRACT, modify section 3.4 AWARD OF CONTRACT, by deleting subsection 3.4.4 and substituting the following 3.4.4:

"3.4.4 The contract will be drawn on the offer forms and accepted by the Comptroller. The contract will not be binding upon the Department until all required signatures have been affixed thereto and written certification that funds are available for the work has been made."

- N. Under ARTICLE 3 - AWARD AND EXECUTION OF CONTRACT, modify section 3.7 REQUIREMENT OF PERFORMANCE AND PAYMENT BONDS by deleting subsections 3.7.1, 3.7.1.2, and 3.7.1.3 and substituting the following new subsections 3.7.1, 3.7.1.1, and 3.7.1.2:

"3.7.1 Performance and Payment Bonds shall be required for contracts \$25,000 and higher. At the time of contract award, the successful Bidder shall file good and sufficient performance and payment bonds on the form furnished by the Department (see Appendix), each in an amount equal to one hundred percent (100%) of the amount of the contract price unless otherwise stated in the solicitation of bids. Acceptable performance and payment bonds shall be limited to the following:

3.7.1.1 Surety bonds underwritten by a company licensed to issue bonds in this State; or

3.7.1.2 A certificate of deposit; credit union share certificate; or cashier's, treasurer's, teller's or official check drawn by, or a certified check accepted by, and payable on demand to the State by a bank, a savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration.

(a) These instruments may be utilized only to a maximum of \$100,000.

(b) If the required amount totals over \$100,000, more than one instrument not exceeding \$100,000 each and issued by different financial institutions shall be acceptable."

- O. Under ARTICLE 3 - AWARD AND EXECUTION OF CONTRACT, modify section 3.7 REQUIREMENT OF PERFORMANCE AND PAYMENT BONDS by adding the following new subsection 3.7.3:

"3.7.3 For additional Performance and Payment Bond requirements due to changes in the contract amount after contract award, see section 4.2.4.2 Additional Performance and Payment Bond Increases."

- P. Under ARTICLE 3 - AWARD AND EXECUTION OF CONTRACT, add new Section 3.8 as follows:

"3.8 CAMPAIGN CONTRIBUTIONS BY STATE AND COUNTY CONTRACTORS - Contractors are hereby notified of the applicability of Section 11-355 HRS, which states that campaign contributions are prohibited from specified State or County government contractors during the term of the contract if the contractors are paid with funds appropriated by a legislative body."

- Q. Under ARTICLE 3 - AWARD AND EXECUTION OF CONTRACT, modify section 3.8 EXECUTION OF THE CONTRACT, by renumbering the section number to 3.9, related subsection numbers to 3.9.1, 3.9.2, by deleting former subsection 3.8.1 and substituting the following new 3.9.1:

"3.9.1 Upon acceptance of the successful bidder's offer by the Comptroller, the Contractor shall provide satisfactory performance and payment bonds within ten (10) calendar days after award of the contract or within such further time as granted by the Comptroller. No proposal or contract shall be considered binding upon the State until the contract has been fully and properly executed by all parties thereto and the Comptroller has endorsed thereon its certificate, as required by Section 103D-309, HRS, that there is an available unexpended appropriation or balance of an appropriation over and above all outstanding contracts sufficient to cover the State's amount required by such contract."

- R. Under ARTICLE 3 - AWARD AND EXECUTION OF CONTRACT, modify section 3.9 FAILURE TO EXECUTE THE CONTRACT, by renumbering the section number to 3.10, related subsection numbers to 3.10.1, 3.10.2, 3.10.3, by deleting former subsection 3.9.2 and substituting the following new 3.10.2:

"3.10.2 After the Award - If the Bidder to whom contract is awarded shall fail or neglect to furnish satisfactory security within ten (10) calendar days after such award or within such further time as the Comptroller may allow, the State shall be entitled to recover from such Bidder its actual damages, including but not limited to the difference between the bid and the next lowest responsive bid, as well as personnel and administrative costs, consulting and legal fees and other expenses incurred in arranging a contract with the next low responsive bidder or calling for new bids. The State may apply all or part of the amount of the bid security to reduce damages. If upon determination by the State of the amount of its damages the bid security exceeds that amount, it shall release or return the excess to the person who provided same."

- S. Under ARTICLE 3 - AWARD AND EXECUTION OF CONTRACT, renumber Section 3.10 NOTICE TO PROCEED and related subsection numbers to 3.11, 3.11.1, 3.11.2, 3.11.3 and 3.11.4.

- T. Under ARTICLE 4 - SCOPE OF WORK, modify Section 4.2 CHANGES, by deleting subsection 4.2.4.2 and substituting the following new subsection 4.2.4.2:

"4.2.4.2 Performance and Payment Bond Increases. When the contract price is increased, performance and payment bonds shall each be automatically increased in amounts equal to one hundred percent (100%) of the increase in contract price."

- U. Under ARTICLE 4 - SCOPE OF WORK, modify Section 4.2 CHANGES, by deleting subsection 4.2.4.3 and substituting the following two new subsections:

"4.2.4.3 Upon receipt of a change order, that the Contractor does not agree with any of the terms or conditions or the adjustments or non adjustments of the contract price or contract time; the Contractor shall not execute or sign the change order, but shall return the unsigned change order, along with a written notification of the conditions or items that are in dispute.

4.2.4.4 If the Contractor signs or executes the change order, this constitutes an agreement on the part of the Contractor with the terms and conditions of the change order. A change order that is mutually agreed to and signed by the parties of the contract constitutes a contract modification."

- V. Under ARTICLE 4 - SCOPE OF WORK, modify section 4.2 CHANGES, by adding the following three new subsections 4.2.5 through 4.2.7:

4.2.5 Claim Notification - The Contractor shall file a notice of intent to claim for a disputed change order within 30 calendar days after receipt of the written order. Failure to file the protest within the time specified constitutes an agreement on the part of the Contractor with the terms, conditions, amounts and adjustment or non-adjustment to contract price or contract time set forth in the disputed change order. The requirement for timely written notice shall be a condition precedent to the assertion of a claim.

4.2.6 Proceeding with Directed Work - Upon receipt of a contract modification, change order, or field order, the Contractor shall proceed with the directed changes and instructions. The Contractor's right to make a claim for additional compensation or an extension of time for completion is not affected by proceeding with the changes and instructions described in a change order and field order.

4.2.7 Pricing or Negotiating Costs Not Allowed - The Contractor's cost of responding to requests for price or time adjustments is included in the contract price. No additional compensation will be allowed unless authorized by the Contracting Officer."

- W. Under ARTICLE 4 - SCOPE OF WORK, modify section 4.3 Duty of Contractor to Provide Proposal for Changes, by deleting subsection 4.3.4.

- X. Under ARTICLE 4 - SCOPE OF WORK, modify section 4.4 PRICE ADJUSTMENT, by deleting subsection 4.4.1 and substituting subsection 4.4.1 and adding a new subsection 4.4.2 and modify section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT, by deleting subsections 4.5.1, 4.5.2 and 4.5.3 and substituting subsections 4.5.1, 4.5.2 and 4.5.3 as follows:

"4.4 PRICE ADJUSTMENT HRS 103D-501

4.4.1 A fully executed change order or other document permitting billing for the adjustment in price under any method listed in paragraphs (4.4.1.1) through (4.4.1.5) shall be issued within ten days after agreement on the price adjustment. Any adjustment in the contract price pursuant to a change or claim in this contract shall be made in one or more of the following ways:

4.4.1.1 By agreement to a fixed price adjustment before commencement of the pertinent performance;

4.4.1.2 By unit prices specified in the contract or subsequently agreed upon before commencement of the pertinent performance;

4.4.1.3 Whenever there is a variation in quantity for any work covered by any line item in the schedule of costs submitted as required by Section 7.2 COMMENCEMENT REQUIREMENTS, by the Department at its discretion, adjusting the lump sum price proportionately;

4.4.1.4 **FORCE ACCOUNT METHOD.** At the sole option of the Contracting Officer, by the costs attributable to the event or situation covered by the change, plus appropriate profit or fee, all as specified in Section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT and the force account provision of Section 8.3 PAYMENT FOR ADDITIONAL WORK before commencement of the pertinent performance;

4.4.1.5 In such other manner as the parties may mutually agree upon before commencement of the pertinent performance; or

4.4.1.6 In the absence of an agreement between the two parties:

4.4.1.6.a For change orders with value not exceeding \$50,000 by documented actual costs of the work, allowing for overhead and profit as set forth in Section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT. A change order shall be issued within fifteen days of submission by the contractor of proper documentation of completed force account work, whether periodic (conforming to the applicable billing cycle) or final. The contracting officer shall return any documentation that is defective to the contractor within fifteen days after receipt, with a statement identifying the defect; or

4.4.1.6.b For change orders with value exceeding \$50,000 by a unilateral determination by the Contracting Officer of the reasonable and necessary costs attributable to the event or situation covered by the change, plus appropriate profit or fee, all as computed by the Contracting Officer in accordance with applicable sections of Chapters 3-123 and 3-126 of the Hawaii Administrative Rules, and Section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT. When a unilateral determination has been made, a unilateral change order shall be issued within ten days. Upon receipt of the unilateral change order, if the contractor does not agree

with any of the terms or conditions, or the adjustment or nonadjustment of the contract time or contract price, the contractor shall file a notice of intent to claim within thirty days after the receipt of the written unilateral change order. Failure to file a protest within the time specified shall constitute agreement on the part of the contractor with the terms, conditions, amounts, and adjustment or nonadjustment of the contract time or the contract price set forth in the unilateral change order.

4.4.2 Cost or Pricing Data - Contractor shall provide and certify cost or pricing data for any price adjustment to a contract involving aggregate increases and decreases in costs plus applicable profits expected to exceed \$100,000. The certified cost or pricing data shall be subject to the provisions of HAR chapter 3- 122, subchapter 15.

4.5 ALLOWANCES FOR OVERHEAD AND PROFIT HRS103D-501

4.5.1 In determining the cost or credit to the Department resulting from a change, the allowances for all overhead, including, extended overhead resulting from adjustments to contract time (including home office, branch office and field overhead, and related delay impact costs) and profit combined, shall not exceed the percentages set forth below:

4.5.1.1 For the Contractor, for any work performed by its own labor forces, twenty percent (20%) of the direct cost;

4.5.1.2 For each subcontractor involved, for any work performed by its own forces, twenty percent (20%) of the direct cost;

4.5.1.3 For the Contractor or any subcontractor, for work performed by their subcontractors, ten percent (10%) of the amount due the performing subcontractor.

4.5.2 Not more than three markup allowance line item additions not exceeding the maximum percentage shown above will be allowed for profit and overhead, regardless of the number of tier subcontractors.

4.5.3 The allowance percentages will be applied to all credits and to the net increase of direct costs where work is added and deleted by the changes."

Y. Under ARTICLE 5 - CONTROL OF THE WORK, modify section 5.4 SHOP DRAWINGS AND OTHER SUBMITTALS, by deleting subsection 5.4.14 and 5.4.15 and substitute the following new subsections:

"5.4.1.4 Descriptive Sheets and Other Submittals - When a submittal is required by the contract, the Contractor shall submit to the Contracting Officer eight (8) complete sets of descriptive sheets such as shop drawings, brochures, catalogs, illustrations, calculation, safety data sheets (SDS), certificates, reports, warranty, etc., which will completely describe the material, product, equipment, furniture or appliance to be used in the project as shown in the drawings and specifications and how it will be integrated into adjoining construction. When submittals are specified to be submitted under Web Based Construction Management System, the number of complete sets will be as specified or as directed by the Contracting Officer. Prior to the submittal,

the Contractor shall review and check all submittal sheets for conformity to the contract requirements and indicate such conformity by marking or stamping and signing each sheet. Where descriptive sheets include materials, systems, options, accessories, etc. that do not apply to this contract, non-relevant items shall be crossed out so that all remaining information will be considered applicable to this contract. It is the responsibility of the Contractor to submit descriptive sheets for review and acceptance by the Contracting Officer as required at the earliest possible date after the date of award in order to meet the Contract Duration. Delays caused by the failure of the Contractor to submit descriptive sheets as required will not be considered as justification for contract time extension.

5.4.1.5 Material Samples and Color Samples - When material and color sample submittals are required by the contract, the Contractor shall submit to the Contracting Officer no less than three (3) samples conforming to Section 6.6 MATERIAL SAMPLES. One sample will be retained by the Consultant, one sample will be retained by the State, and the remaining sample(s) will be returned to the Contractor. Prior to the material and color submittal, the Contractor shall review and check all samples for conformity to the contract requirements and indicate such conformity by marking or stamping and signing each sample. It is the responsibility of the Contractor to submit samples for review and acceptance by the Contracting Officer as required at the earliest possible date after the date of award in order to meet the Contract Duration. Delays caused by the failure of the Contractor to submit material and color samples as required will not be considered as justification for contract time extension.

5.4.1.6 Unless the technical sections (Divisions 2 - 16) specifically require the Contractor furnish a greater quantity of shop drawings and other submittals, the Contractor shall furnish the quantities required by this section."

- Z. Under ARTICLE 5 - CONTROL OF THE WORK, modify section 5.8 COOPERATION BETWEEN THE CONTRACTOR AND THE DEPARTMENT, by deleting the subsection 5.8.1 and substitute the following new subsection 5.8.1:

"5.8.1 Furnishing Drawings and Specifications - HDOT will not furnish hard copies of contract plans and specifications to Contractors. Contractors who receive award for projects shall download the files of drawings and specifications from HlePRO, and make their own hard copies. Contractor shall have and maintain at least one hard copy of the Contract Drawings and Specifications on the work site, at all times."

- AA. Under ARTICLE 5 - CONTROL OF THE WORK, modify section 5.12 SUBCONTRACTS, by deleting the subsection 5.12 and related paragraphs and substitute the following new subsection 5.12 and related paragraphs:

"5.12 SUBCONTRACTS - Nothing contained in the contract documents shall create a contractual relationship between the State and any subcontractor. The contractor may subcontract a portion of the work but the contractor shall remain responsible for the work that is subcontracted.

5.12.1 Replacing Subcontractors - Contractors may enter into subcontracts only with subcontractors listed in the offer form. The contractor will be allowed to replace a listed subcontractor if the subcontractor:

5.12.1.1 Fails, refuses or is unable to enter into a subcontract consistent with the terms and conditions of the subcontractor's offer presented to the contractor; or

5.12.1.2 Becomes insolvent; or

5.12.1.3 Has any license or certification necessary for performance of the work suspended or revoked; or

5.12.1.4 Has defaulted or has otherwise breached the subcontract in connection with the subcontracted work; or

5.12.1.5 Agrees to be substituted by providing a written release; or

5.12.1.6 Is unable or refuses to comply with other requirements of law applicable to contractors, subcontractors, and HDOT projects.

5.12.2 Notice of Replacing Subcontractor - The Contractor shall provide a written notice to the Contracting Officer when it replaces a subcontractor, including in the notice, the reasons for replacement. The Contractor agrees to defend, hold harmless, and indemnify the State against all claims, liabilities, or damages whatsoever, including attorney's fees, arising out of or related to the replacement of a subcontractor.

5.12.3 Adding Subcontractors - The Contractor may enter into a subcontract with a subcontractor that is not listed in the offer form only after this contract becomes enforceable.

5.12.4 Subcontracting - Contractor shall perform with its own organization, work amounting to not less than twenty (20%) of the total contract cost, exclusive of costs for materials and equipment the Contractor purchases for installation by its subcontractors, except that any items designated by the State in the contract as "specialty items" may be performed by a subcontract and the cost of any such specialty items so performed by the subcontract may be deducted from the total contract cost before computing the amount of work required to be performed by the Contractor with its own organization."

BB. Under ARTICLE 6 - CONTROL OF MATERIALS AND EQUIPMENT, modify Section 6.3 SUBSTITUTION OF MATERIALS AND EQUIPMENT AFTER BID OPENINGS, by renaming section 6.3 SUBSTITUTION AFTER CONTRACT AWARD and by deleting subsections 6.3.1 through 6.3.3 and related paragraphs, and substitute the following two new subsections 6.3.1 and 6.3.2 and related paragraphs:

"**6.3.1** Materials, equipment, articles and systems noted on the drawings and specifications, establish a standard of quality, function, performance or design requirements and shall not be interpreted to limit competition. Should trade names, makes, catalog numbers or brand names be specified, the contractor shall infer that these items indicate the quality, style, appearance or performance of the material,

equipment, article, or systems to be used in the project. The contractor is responsible to use materials, equipment, articles or systems that meet the project requirements. Unless specifically provided otherwise in the contract documents, the contractor may, at its option, use any material, equipment, article or system that, in the judgment of the Contracting Officer, is equal to that required by the contract documents.

6.3.1.1 If after installing a material, equipment, article or system a variance is discovered, the contractor shall immediately replace the material, equipment, article or system with one that meets the requirements of the contract documents.

6.3.2 Substitution After Contract Award - Subject to the Contracting Officer's determination; material, equipment, article or system with a variant feature(s) may be allowed as a substitution, provided it is in the State's best interest. The State may deny a substitution; and if a substitution is denied, the contractor is not entitled to any additional compensation or time extension.

6.3.2.1 The Contractor shall include with the submittal, a notification that identifies all deviations or variances from the contract documents. The notice shall be in a written form separate from the submittal. The variances shall be clearly shown on the shop drawing, descriptive sheet, and material sample or color sample; and the Contractor shall certify that the substitution has no other variant features. Failures to identify the variances are grounds to reject the related work or materials, notwithstanding that the Contracting Officer accepted the submittal. If the variances are not acceptable to the Contracting Officer, the contractor will be required to furnish the item as specified on the contract documents at no additional cost or time.

6.3.2.2 Acceptance of a variance shall not justify a contract price or time adjustment unless the Contractor requests an adjustment at the time of submittal and the adjustments are explicitly agreed to in writing by the Contracting Officer. Any request shall include price details and proposed scheduling modifications. Acceptance of a variance is subject to all contract terms, and is without prejudice to all rights under the surety bond.

6.3.2.3 The Contractor can recommend improvements to the project, for materials, equipment, articles, or systems by means of a substitution request, even if the improvements are at an additional cost. The Contracting Officer shall make the final determination to accept or reject the Contractor's proposed improvements. If the proposed material, equipment, article or system cost less than the specified item, the Department will require a sharing of cost similar to value engineering be implemented. State reserves its right to deny a substitution; and if a substitution is denied, the contractor is not entitled to additional compensation or time extension."

CC. Under Article 7 - PROSECUTION AND PROGRESS, modify section 7.2 SCHEDULE OF PRICES by deleting paragraph 7.2.4.1 and substitute the following paragraph 7.2.4.1:

"7.2.4.1 The Contractor shall estimate at the close of each month the percentage of work completed under each of the various construction items during such month and

submit the Monthly Payment Application to the Contracting Officer for review and approval. The Contractor shall be paid the approved percentage of the price established for each item less the retention provided in Section 8.4 PROGRESS PAYMENTS."

- DD. Under Article 7 - PROSECUTION AND PROGRESS, add the following paragraph 7.2.4A:

"7.2.4A Subcontracts. Upon award of a contract and prior to starting any construction work, the Contractor shall submit to the Contracting Officer a list of all subcontractors and the actual subcontracted dollar amount for each of its subcontractors regardless of the amount of the subcontract.
See section 7.39 - Employment of State Residents Requirements."

- EE. Under ARTICLE 7- PROSECUTION AND PROGRESS, modify section 7.2.5 PROOF OF INSURANCE COVERAGE, by deleting subsection 7.2.5 and substitute the following:

"7.2.5 Proof of Insurance Coverage - Certificate of Insurance or other documentary evidence satisfactory to the Contracting Officer that the Contractor has in place all insurance coverage required by the contract. The Certificate of Insurance shall contain wording which identifies the Project number and Project title for which the certificate of insurance is issued. Refer to Section 7.3 INSURANCE REQUIREMENTS."

- FF. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify paragraph 7.26, by deleting the paragraph and substitute the following:

"7.26 Safety and Health Plan for this project. Refer to HRS Section 396-18.

7.27 Until such time as the above items are processed and receipt is confirmed, the Contractor shall not be allowed to commence on any operations unless authorized by the Engineer."

- GG. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.3 INSURANCE REQUIREMENTS, by deleting subsection 7.3.3 and substitute the following new subsection 7.3.3:

"7.3.3 Certificate(s) of Insurance acceptable to the State shall be filed with the Contracting Officer prior to commencement of the work. Certificates shall identify if the insurance company is a "captive" insurance company or a "Non-Admitted" carrier to the State of Hawaii. The best's rating must be stated for the "Non- Admitted" carrier. Certificates shall contain a provision that coverages being certified will not be cancelled or materially changed without giving the Contracting Officer at least thirty (30) days prior written notice. Should any policy be canceled before final acceptance of the work by the State, and the Contractor fails to immediately procure replacement insurance as specified, the State, in addition to all other remedies it may have for such breach, reserves the right to procure such insurance and deduct the cost thereof from any money due to the Contractor."

- HH. Under ARTICLE 7- PROSECUTION AND PROGRESS, modify section 7.3 INSURANCE REQUIREMENTS, by deleting subsection 7.3.7.2 and substitute the following new subsection 7.3.7.2:

"7.3.7.2 General Liability - The Contractor shall obtain General Liability insurance with a limit of not less than \$2,000,000 per occurrence and in the Aggregates. The insurance policy shall contain the following clauses: 1) "The State of Hawaii is added as an additional insured as respects to operations performed for the State of Hawaii."; and 2) "It is agreed that any insurance maintained by the State of Hawaii will apply in excess of, and not contributed with, insurance provided by this policy." The required limit of insurance may be provided by a single policy or with a combination of primary and excess polices. Refer to SPECIAL CONDITIONS for any additional requirements."

- II. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.3 INSURANCE REQUIREMENTS, by deleting subsection 7.3.7.3 and substitute the following new subsection 7.3.7.3:

"7.3.7.3 Auto Liability - The Contractor shall obtain Auto Liability Insurance covering all owned, non-owned and hired autos with a Combined single Limit of not less than \$1,000,000 per occurrence. The insurance policy shall contain the following clauses: 1) "The State of Hawaii is added as an additional insured as respects to operations performed for the State of Hawaii."; and 2) "It is agreed that any insurance maintained by the State of Hawaii will apply in excess of, and not contributed with, insurance provided by this policy." The required limit of insurance may be provided by a single policy or with a combination of primary and excess polices. Refer to SPECIAL CONDITIONS for any additional requirements."

- JJ. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.3 INSURANCE REQUIREMENTS, by deleting subsection 7.3.7.4 and substitute the following new subsection 7.3.7.4:

"7.3.7.4 Property Insurance (Builders Risk)

(a) New Building(s) - The Contractor shall obtain Property Insurance covering building(s) being constructed under this Contract. The limit shall be equal to the completed value of the building(s) and shall insure against all-loss excluding earthquakes and floods. The coverage shall be provided by a company authorized to write insurance in the State of Hawaii as an insurer. The insurance policy shall contain the following clauses: 1) "The State of Hawaii is added as an additional insured as respects to operations performed for the State of Hawaii."; and 2) "It is agreed that any insurance maintained by the State of Hawaii will apply in excess of, and not contributed with, insurance provided by this policy." Refer to SPECIAL CONDITIONS for any additional requirements.

(b) Building Renovation and / or Installation Contract - The Contractor shall obtain Property Insurance with a limit equal to the completed value of the work or

property being installed and shall insure against all-loss excluding earthquakes and floods. The coverage shall be provided by a company authorized to write insurance in the State of Hawaii as an insurer. The insurance policy shall contain the following clauses: 1) "The State of Hawaii is added as an additional insured as respects to operations performed for the State of Hawaii."; and 2) "It is agreed that any insurance maintained by the State of Hawaii will apply in excess of, and not contributed with, insurance provided by this policy." Refer to SPECIAL CONDITIONS for any additional requirements.

(c) The Contractor is not required to obtain property insurance for contracts limited to site development."

KK. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.7 PREVAILING WAGES, by deleting subsection 7.7.4 and substitute the following new subsection 7.3.7.4:

"The wage rate schedule is not physically enclosed in the bid documents. However, the wage rate schedule is incorporated herein by reference and made a part of the Bid and Contract Documents. Said wage rate schedule may be obtained from Department of Labor and Industrial Relations website: <http://labor.hawaii.gov/wsd> or, via the FAX-ON-DEMAND system of the DLIR, phone number (808) 586-8695."

LL. Under Article 7 - PROSECUTION AND PROGRESS, add the following section 7.9A- APPRENTICESHIP AGREEMENT CERTIFICATION

"7.9A APPRENTICESHIP AGREEMENT CERTIFICATION (HRS §103-55.6)

7.9A.1 For the duration of a contract awarded and executed utilizing the apprenticeship agreement preference the Contractor shall certify, for each month that work is being conducted on the project, that it continues to be a participant in the relevant registered apprenticeship program for each trade it employs.

7.9A.2 Monthly certification shall be made by completing the Monthly Report of Contractor's Participation - Form 2 made available by the State Department of Labor and Industrial Relations, the original to be signed by the respective apprenticeship program sponsors authorized official, and submitted by the Contractor to the Engineer with its monthly payment requests. The Monthly Report of Contractor's Participation - Form 2 available on the DLIR website at:
<https://labor.hawaii.gov/wdd/files/2012/12/Form-2-Monthly-Report-of-Contractors-Participation.pdf>

7.9A.3 Should the Contractor fail or refuse to submit its Monthly Report of Contractor's Participation - Form 2, or at any time during the duration of the contract, cease to be a party to a registered apprenticeship agreement for any of the apprenticeable trades the Contractor employs, or will employ, the Contractor will be subject to the following sanctions:

7.9A.3.1 Withholding of the requested payment until all of the required Monthly report of Contractor's Participation - Form 2s are properly completed and submitted.

7.9A.3.2 Temporary or permanent cessation of work on the project, without recourse to breach of contract claims by the Contractor; provided the Department shall be entitled to restitution for nonperformance or liquidated damages claims; or

7.9A.3.3 Proceedings to debar or suspend pursuant to HRS §103D-702.

7.9A.4 If events such as "acts of God," acts of a public enemy, acts of the State or any other governmental body in its sovereign or contractual capacity, fires, floods, epidemics, freight embargoes, unusually severe weather, or strikes or other labor disputes prevent the Contractor from submitting the Monthly Report of Contractor's Participation - Form 2, the Contractor shall not be penalized as provided herein, provided the Contractor completely and expeditiously complies with the certification process when the event is over."

MM. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.10 OVERTIME AND NIGHT WORK, by deleting subsection 7.10.2 and substitute the following:

7.10.2 Contractor shall notify the Contracting Officer two working days prior to doing overtime and night work, to ensure proper inspection will be available. The notification shall address the specific work to be done. A notification is not required when overtime work and night work are included as normal working hours in the contract and in the contractor's construction schedule."

NN. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.11 - OVERTIME AND NIGHT PAYMENT FOR STATE INSPECTION SERVICES, by adding new subsection 7.11.1 and renumbering the existing subsections 7.11.1, 7.11.1.1, 7.11.1.2, 7.11.1.3 and 7.11.2 to read 7.11.2, 7.11.2.1, 7.11.2.2, 7.11.2.3 and 7.11.3 respectively. Change subsection reference number (7.11.1) in subsection 7.11.3 - Payment for Inspection Services to read 7.11.2:

7.11.1 The Department is responsible for overtime or night time payments for Department's inspection services, including Department's Inspector, State staff personnel and the Department's Consultant(s) engaged on the project, when overtime and night work are included as normal working hours in the contract and in the contractor's construction schedule."

OO. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.25 - DISPUTES AND CLAIMS, by deleting subsection 7.25.10 and paragraph 7.25.10.1 and substitute the following:

7.25.10 Decision on Claim or Appeal - The Contracting Officer shall decide all controversies between the State and the Contractor which arise under, or are by virtue of, this contract and which are not resolved by mutual agreement. The decision of the Contracting Officer on the claim shall be final and conclusive, unless fraudulent or unless the contractor delivers to the Comptroller a written appeal of the Contracting Officer's decision no later than 30 days after the date of the Contracting Officer's decision. The Comptroller's decision shall be final and conclusive, unless fraudulent or

unless the Contractor brings an action seeking judicial review of the Comptroller's decision in an appropriate circuit court of this State within six months from the date of the Comptroller's decision.

7.25.10.1 If the contractor delivers a written request for a final decision concerning the controversy, the Comptroller shall issue a final decision within 90 days after receipt of such a request; provided that if the Comptroller does not issue a written decision within 90 days, or within such longer period as may be agreed upon by the parties, then the contractor may proceed as if an adverse decision had been received. Both parties to this contract agree that the period of up to 30 days to appeal the Contracting Officer's decision to the Comptroller shall not be included in the 90 day period to issue a final decision."

PP. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.25 - DISPUTES AND CLAIMS, by deleting subsection 7.25.13 Waiver of Attorney's Fees.

QQ. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.31 - SUBSTANTIAL COMPLETION, AND FINAL INSPECTION, by deleting paragraph 7.31.2.1 and substitute the following:

"7.31.2.1 The Contracting Officer shall confirm the list of deficiencies noted by the contractor's punchlist(s) and will notify the contractor of any other deficiencies that must be corrected."

RR. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.32 - PROJECT ACCEPTANCE DATE, by adding new paragraph 7.32.4.1 as follows:

"7.32.4.1 Punchlist corrective work shall be completed prior to Contract Completion Date, or extension thereof."

SS. Under ARTICLE 7 - PROSECUTION AND PROGRESS, modify section 7.32 - PROJECT ACCEPTANCE DATE, by deleting subsection 7.32.7 and substitute the following:

"7.32.7 If the contractor fails to correct the deficiencies within the time established in paragraph 7.32.4.1, the Contracting Officer shall assess liquidated damages as required by section 7.26 - FAILURE TO COMPLETE THE WORK ON TIME."

TT. Under ARTICLE 7 - PROSECUTION AND PROGRESS, add new section 7.39as follows:

"7.39 EMPLOYMENT OF STATE RESIDENTS REQUIREMENTS HRS 1038

7.39.1 A Contractor awarded a contract shall ensure that Hawaii residents comprise not less than 80% of the workforce employed to perform the contract. The 80% requirement shall be determined by dividing the total number of hours worked on the contract by Hawaii residents, by the total number of hours worked on the contract by all employees of the contractor in the performance of the contract. The hours worked by

any subcontractor of the Contractor shall count towards the calculation for purposes of this section. The hours worked by employees within shortage trades, as determined by the Department of Labor and Industrial Relations (DLIR), shall not be included in the calculation for this section.

7.39.2 The requirements of this section shall apply to any subcontract of \$50,000 or more in connection with the Contractor, that is, such subcontractors must also ensure that Hawaii residents comprise not less than 80% of the subcontractor's workforce used to perform the subcontract. See also, section 7.2 - Commencement Requirements.

7.39.3 The Contractor, and any subcontractor whose subcontract is \$50,000 or more, shall comply with the requirements of this section.

7.39.3.1 Certification of compliance shall be made in writing under oath by an officer of the Contractor and applicable subcontractors and submitted with the final payment request.

7.39.3.2 The certification of compliance shall be made under oath by an officer of the company by completing a Certification of Compliance for Employment of State Residents form and executing the Certificate before a licensed notary public. See attached form at the end of Section 00700 - General Conditions.

7.39.3.3 In addition to the certification of compliance as indicated above, the Contractor and any subcontractors shall maintain records such as certified payrolls for laborers and mechanics who performed work at the site and timesheets for all other employees who performed work on the project. These records shall include the names, addresses and number of hours worked on the project by all employees of the Contractor and subcontractors who performed work on the project to validate compliance with this section. The Contractor and Subcontractors shall maintain, retain, and provide access to these records in accordance with Section 7.38 - RECORDS MAINTENANCE, RETENTION AND ACCESS, except that these provisions shall apply to all contracts, regardless of the value of the contract.

7.39.4 A Contractor or applicable subcontractor who fails to comply with this section shall be subject to any of the following sanctions:

7.39.4.1 With respect to the General Contractor, withholding of payment on the contract until the Contractor or its subcontractor complies with this section; or

7.39.4.2 Proceedings for debarment or suspension of the Contractor or subcontractor under Hawaii Revised Statutes §103D-702.

7.39.5 Conflict with Federal Law - This section shall not apply if the application of this section is in conflict with any federal law, or if the application of this section will disqualify the State from receiving Federal funds or aid. See Section 00800 - Special Conditions to determine if this section does not apply."

UU. Under ARTICLE 8 - MEASUREMENT AND PAYMENT, Section 8.3 PAYMENT FOR ADDITIONAL WORK, modify clause 8.3.4.5(h) by changing the replacement value from 'five hundred dollars (\$500)' to read "\$1,000."

VV. Under ARTICLE 8 - MEASUREMENT AND PAYMENT, modify section 8.3 PAYMENT FOR ADDITIONAL WORK, by deleting subsection 8.3.1 and substitute the following new subsections and paragraph:

"8.3.1 Payment for Changed Conditions - A contract modification or change order complying with section 4.4 PRICE ADJUSTMENT and section 4.5 ALLOWANCES FOR OVERHEAD AND PROFIT shall be issued for all changes that are directed under Section 4.2 CHANGES. No payment for any change including work performed under the force account provisions will be made until a change order is issued or contract modification is executed.

8.3.1.1 At the completion of the force account work or at an intermediate interval approved by the Contracting Officer, the contractor shall submit its force account cost proposal, including; approved daily force account records with any attached invoices or receipt, to the Department for processing a contract modification or change order."

WW. Under Article 8 - MEASUREMENT AND PAYMENT, modify section 8.4 PROGRESS AND/OR PARTIAL PAYMENTS, by deleting section and related SUBSECTIONS 8.4.1 thru 8.4.4.4 and substitute the following new section 8.4 and related subsections 8.4.1 thru 8.4.4.4:

"8.4 PROGRESS PAYMENTS

8.4.1 Progress Payments - The Contractor will be allowed progress payments on a monthly basis upon preparing the Monthly Payment Application forms and submitting them to the Contracting Officer. The monthly payment shall be based on the items of work satisfactorily completed and the value thereof at unit prices and/or lump sum prices set forth in the contract as determined by the Contracting Officer and will be subject to compliance with Section 7.9 PAYROLLS AND PAYROLL RECORDS.

8.4.2 In the event the Contractor or any Subcontractor fails to submit certified copies of payrolls in accordance with the requirements of Section 7.9 PAYROLLS AND PAYROLL RECORDS, the Contracting Officer may retain the amount due for items of work for which payroll affidavits have not been submitted on a timely basis notwithstanding satisfactory completion of the work until such records have been duly submitted. The Contractor shall not be due any interest payment for any amount thus withheld.

8.4.3 Payment for Materials - The Contractor will also be allowed payments of the manufacturer's, supplier's, distributor's or fabricator's invoice cost of accepted materials to be incorporated in the work on the following conditions:

8.4.3.1 The materials are delivered and properly stored at the site of Work; or

8.4.3.2 For special items of materials accepted by the Contracting Officer, the materials are delivered to the Contractor or subcontractor(s) and properly stored in an acceptable location within a reasonable distance to the site of Work.

8.4.4 Payments shall be made only if the Contracting Officer finds that:

8.4.4.1 The Contractor has submitted bills of sale for the materials or otherwise demonstrates clear title to such materials.

8.4.4.2 The materials are insured for their full replacement value to the benefit of the Department against theft, fire, damages incurred in transportation to the site, and other hazards.

8.4.4.3 The materials are not subject to deterioration.

8.4.4.4 In case of materials stored off the project site, the materials are not commingled with other materials not to be incorporated into the project."

XX. Under ARTICLE 8- MEASUREMENT AND PAYMENT, modify section 8.5 PROMPT PAYMENT, by deleting section 8.5 and related subsections 8.5.1 thru 8.5.6 and substitute the following new section 8.5 and related subsections 8.5.1 thru 8.5.9:

8.5.1 Any money paid to a Contractor for work performed by a subcontractor shall be disbursed to such subcontractor 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 Contracting Officer has withheld payment.

8.5.2 Upon final payment to the Contractor, full payment to all subcontractors shall be made within ten (10) days after receipt of the money, provided there are no bona fide disputes over the subcontractor's performance under the subcontract.

8.5.3 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 subsection 8.5.2 and section 103-10 HRS:

8.5.3.1 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 subsection (8.5.5) of this section, and:

8.5.3.1.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 8.6 RETAINAGE; or

8.5.3.1.b The following has occurred:

8.5.3.1.b.1 A period of ninety 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

8.5.3.1.b.2 The subcontractor has provided to the contractor:

8.5.3.1.b.2.1 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 times the amount being retained or withheld by the contractor;

8.5.3.1.b.2.2 Any other bond acceptable to the contractor; or

8.5.3.1.b.2.3 Any other form of mutually acceptable collateral.

8.5.4 If the contracting officer or the contractor fails to pay in accordance with this section, a penalty of one and one-half per cent per month shall be imposed upon the outstanding amounts due that were not timely paid by the responsible party. The penalty may be withheld from future payment due to the contractor, if the contractor was the responsible party. If a contractor has violated subsection 8.5.2 three or more times within two years of the first violation, the contractor shall be referred by the contracting officer to the contractor license board for action under section 444-17(14) HRS.

8.5.5 Final Payment Request. A properly documented final payment request from a subcontractor, as required by subsection 8.5.3, shall include:

8.5.5.1 Substantiation of the amounts requested;

8.5.5.2 A certification by the subcontractor, to the best of the subcontractor's knowledge and belief, that:

8.5.5.2.a The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the subcontract;

8.5.5.2.b 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

8.5.5.2.c 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

8.5.5.2.d The submission of documentation confirming that all other terms and conditions required under the subcontract agreement have been fully satisfied.

8.5.6 The contracting officer shall return any final payment request that is defective to the contractor within seven days after receipt, with a statement identifying the defect.

8.5.7 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 subsection 8.5.3 unless the payment request includes:

8.5.7.1 Substantiation of the amounts requested; and

8.5.7.2 A certification by the contractor, to the best of the contractor's knowledge and belief, that:

8.5.7.2.a The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the contract;

8.5.7.2.b 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

8.5.7.2.c 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.

8.5.8 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 subsection 8.5.3 of this section; provided that any such payments withheld shall be withheld by the contracting officer."

YY. Under ARTICLE 8 - MEASUREMENT AND PAYMENT, modify section 8.6 RETAINAGE, by deleting section 8.6 and related subsections 8.6.1 thru 8.6.3 and substituting the following new section 8.6 and related subsections:

"8.6 RETAINAGE - The Department will retain a portion of the amount due under the contract to the contractor, to ensure the proper performance of the contract.

8.6.1 The sum withheld by the Department from the contractor shall not exceed ten (10) per cent of the total amount due the contractor and that after fifty per cent of the contract is completed and progress is satisfactory, no additional sum shall be withheld; provided further that if progress is not satisfactory, the contracting officer may continue

to withhold as retainage, sums not exceeding ten (10) per cent of the amount due the contractor.

8.6.2 The retainage shall not include sums deducted as liquidated damages from moneys due or that may become due the contractor under the contract.

8.6.3 General Obligation Bonds - The contractor may withdraw retainage monies in whole or in part by providing a general obligation bond of the State or its political subdivisions suitable to the Department. The contractor shall endorse over to the Department and deposit with the Department any general obligation bond suitable to the Department, but in no case with a face value less than the value established by law, of the amount to be withdrawn. The Department may sell the bond and use the proceeds in the same way as it may use monies directly retained from progress payments or the final payment.

8.6.4 Any retainage provided for in this section or requested to be withheld by the contractor shall be held by the contracting officer.

8.6.5 A dispute between a contractor and subcontractor of any tier shall not constitute a dispute to which the State or any county is a party, and there is no right of action against the State or any county. The State and a county may not be interpleaded in any judicial or administrative proceeding involving such a dispute.

8.6.6 The retention amount withheld by the contractor from its subcontractor shall be not more than the same percentage of retainage as that of the contractor (also applies to subcontractors who subcontract work to other subcontractors) where a subcontractor has provided evidence to the contractor of:

8.6.6.1 A valid performance and a payment bond for the project that is acceptable to the contractor and executed by a surety company authorized to do business in this State;

8.6.6.2 Any other bond acceptable to the contractor; or

8.6.6.3 Any other form of collateral acceptable to the contractor.

8.6.7 A written notice of any withholding shall be issued to a subcontractor, with a copy to the procurement officer, specifying the following:

8.6.7.1 The amount to be withheld;

8.6.7.2 The specific causes for the withholding under the terms of the subcontract; and

8.6.7.3 The remedial actions to be taken by the subcontractor to receive payment of the amounts withheld.

8.6.8 The provisions of this section shall not be construed to require payment to subcontractors of retainage released to a contractor pursuant to an agreement entered into with the contracting officer meeting the requirements of subsection 8.6.3."

ZZ. Under Article 8- MEASUREMENT AND PAYMENT, modify section 8.7 WARRANTY OF CLEAR TITLE, by deleting section and substitute the following new section 8.7:

"8.7 WARRANTY OF CLEAR TITLE - The Contractor warrants and guarantees that all work and materials covered by progress payments made thereon shall be free and clear of all liens, claims, security interests or encumbrances, and shall become the sole property of the Department. This provision shall not, however, be construed as an acceptance of the work nor shall it be construed as relieving the Contractor from the sole responsibility for all materials and work upon which payments have been made or the restoration of any damaged work, or as waiving the right of the Department to require the fulfillment of all the items of the contract."

AAA. Under Article 8 - MEASUREMENT AND PAYMENT, modify section 8.8- FINAL PAYMENT, by deleting subsection 8.8.1 and substitute the following new subsection 8.8.1:

"8.8.1 Upon final settlement, the final payment amount, less all previous payments and less any sums that may have been deducted in accordance with the provisions of the contract, will be paid to the contractor, provided the contractor has submitted the following documents with the request for final payment: a) a current "Certificate of Vendor Compliance" issued by the Hawaii Compliance Express (HCE); and b) an originally notarized Certificate of Compliance for Employment of State Residents signed under oath by an officer of the Contractor and applicable subcontractors pursuant to chapter 1038 HRS. The Certificate of Vendor Compliance is used to certify the Contractor's compliance with: a) Section 103D-328, HRS (for all contracts \$25,000 or more) which requires a current tax clearance certificate issued by the Hawaii State Department of Taxation and the Internal Revenue Service; b) Chapters 383, 386, 392, and 393, HRS; and c) Subsection 103D-310(c), HRS. The State reserves the right to verify that compliance is current prior to the issuance of final payment. Contractors are advised that non-compliance status will result in final payment being withheld until compliance is attained."

BBB. Under Article 8- MEASUREMENT AND PAYMENT, modify section 8.9- CLAIMS ARISING OUT OF PAYMENT FOR REQUIRED WORK, by deleting section and substitute the following new section 8.9:

"8.9 CLAIMS ARISING OUT OF PAYMENT FOR REQUIRED WORK - If the Contractor disputes any determination made by the Contracting Officer regarding the amount of work satisfactorily completed, or the value thereof, or the manner in which payment therefore is made or calculated, it shall notify the Contracting Officer in writing of the specific facts supporting the Contractor's position. Such notice shall be delivered to the Contracting Officer no later than thirty (30) days after the Contractor has been tendered payment for the subject work, or, if no payment has been tendered, not later than fifty (50) days after it has submitted the Monthly Payment Application required under Section 8.4 PROGRESS PAYMENTS herein to the Contracting Officer for the work that is the subject of the dispute. The delivery of the written notice cannot be

waived and shall be a condition precedent to the filing of the claim. No claim for additional compensation for extra work or change work shall be allowed under this provision, unless the notice requirements of Article 4 SCOPE OF WORK have been followed. Acceptance of partial payment of a Monthly Payment Application amount shall not be deemed a waiver of the right to make a claim described herein provided the notice provisions are followed. The existence of or filing of a payment claim herein shall not relieve the Contractor of its duty to continue with the performance of the contract in full compliance with the directions of the Contracting Officer. Any notice of claim disputing the final payment made pursuant to Section 8.8 FINAL PAYMENT must be submitted in writing not later than thirty (30) days after final payment that is identified as such has been tendered to the Contractor."

CCC. Add the attached Certification of Compliance for Employment of State Residents form to the Appendix.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

SECTION 00800 - SPECIAL CONDITIONS

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

A. As specified in SECTION 00700 - GENERAL CONDITIONS: The GENERAL CONDITIONS and these SPECIAL CONDITIONS shall govern all work specified in all Divisions and Sections.

B. Revisions to the *GENERAL CONDITIONS*: The following conditions included in this paragraph 1.01 B. and subparagraphs shall govern respective items in the published *INTERIM GENERAL CONDITIONS 1999 Edition* and in SECTION 00700 - GENERAL CONDITIONS, paragraph entitled REVISIONS TO THE GENERAL CONDITIONS.

1. Under ARTICLE 3 - AWARD AND EXECUTION OF CONTRACTS, modify section 3.11 NOTICE TO PROCEED by deleting subsections 3.11.1 and 3.11.2 and substituting the following:

"3.11.1 After the contract is fully executed and signed by the Comptroller, the Contractor will be sent a letter allowing the ordering of approved materials before the formal Notice to Proceed letter is sent. Subsequently, the formal Notice to Proceed letter will be sent informing the Contractor of the date on which it shall proceed with the designated work. The Contractor shall be allowed ten (10) consecutive working days from said date to begin its work. In the event that the Contractor refuses or neglects to start the work, the Comptroller may terminate the contract in accordance with Section 7.27 TERMINATION OF CONTRACT FOR CAUSE."

2. Under ARTICLE 3 - AWARD AND EXECUTION OF CONTRACT, modify section 3.11 NOTICE TO PROCEED, by deleting subsection 3.11.4 and substitute the following new paragraph 3.11.4:

"3.11.4 In the event the Notice to Proceed is not issued within one hundred and eighty (180) days after the date of the bid opening, the Contractor may submit a claim for increased labor and material costs (but not overhead costs) which are directly attributable to the delay beyond the first 180 days. Such claims shall be accompanied with the necessary documentation to justify the claim. No payment will be made for escalation costs that are not fully justified as determined by the State."

3. Under ARTICLE 5 - CONTROL OF THE WORK, modify section 5.12 SUBCONTRACTS, by deleting the subsection 5.12.4 and substitute the following new subsection 5.12.4:

"5.12.4 Subcontracting - Contractor shall perform with its own organization, work amounting to not less than ten (10%) of the total contract cost, exclusive of costs for materials and equipment the Contractor purchases for installation by its subcontractors, except that any items designated by the State in the contract as "specialty items" may be

performed by a subcontract and the cost of any such specialty items so performed by the subcontract may be deducted from the total contract cost before computing the amount of work required to be performed by the Contractor with its own organization."

1.02 SUBMITTAL DATES FOR CLARIFICATIONS

- A. Written requests must be received no later than 4:30 p.m., fourteen calendar days prior to bid opening.

1.03 PROJECT CONTACT PERSON AND DOT CONTACTS

- A. Project Contact - For Contractor's access to the site to view conditions during bidding.

NAME: Ty Fukuroku
POSITION OR TITLE: Civil Engineer
Department of Transportation
Highways Division
Maui District Office
TELEPHONE NUMBER: (808) 873-3535

- B. DOT Highways Contact - For questions or clarifications on the plans and specifications during bidding, offerors must submit by fax "QUESTIONS AND CLARIFICATIONS" form found at the end of this section. For general questions on the procurement requirements or processes call by telephone.

Civil Engineer, DOT Highways Division, Maui District

NAME Ty Fukuroku
FAX NUMBER (808) 873-3534
TELEPHONE NUMBER (808) 873-3535

- C. Project Coordinator

NAME Ty Fukuroku

- D. Websites:

DOT Highways: <https://hidot.hawaii.gov/highways/>

- E. Contacts During Construction: Address and process correspondence through the District Engineer for the DOT Highways Maui District Office.

1.04 LIQUIDATED DAMAGES

- A. In accordance with the GENERAL CONDITIONS, Article 7 - PROSECUTION AND PROGRESS, Section 7.26, FAILURE TO COMPLETE THE WORK ON TIME, upon failure to complete the work or any portion of the work within the time or times fixed in the contract or extension thereof, the Contractor shall pay liquidated damages to the State, in the amount of \$725, per calendar day of delay.
- B. In accordance with the GENERAL CONDITIONS, Article 7 - PROSECUTION AND PROGRESS, Section 7.32, PROJECT ACCEPTANCE DATE; upon failure to correct punchlist deficiencies, within the time or times fixed in the contract or extension thereof, the Contractor shall pay liquidated damages to the State, in the amount equal to 10 percent of the liquidated damages, per calendar day of delay.

- C. In accordance with the GENERAL CONDITIONS, Article 7 - PROSECUTION AND PROGRESS, Section 7.33, FINAL SETTLEMENT OF CONTRACT; upon failure to submit closing documents within the time or times fixed in the contract or extension thereof, the Contractor shall pay liquidated damages to the State, in the amount equal to five percent of the liquidated damages, per calendar day of delay.

1.05 SPECIALTY CONTRACTOR'S AND SUBCONTRACTOR'S LICENSE

- A. Contractor shall be solely responsible to assure that all the specialty licenses required to perform the work are covered by the Contractor or its Subcontractor(s) or joint Contractors.

1.06 WORKING HOURS

- A. The regular working hours for this project are from 7:00 AM to 3:30 PM Monday through Friday, excluding State Holidays, unless otherwise noted or restricted under SECTION 01100 - PROJECT REQUIREMENTS. In the event of conflict, the working hours provisions of specification SECTION 01100 - PROJECT REQUIREMENTS shall govern over this item 1.06.
- B. The Contractor may be given approval to work beyond the regular hours including Saturdays, Sundays, State Holidays, night work, or after hours under the provisions of the GENERAL CONDITIONS, Article 7 - PROSECUTION AND PROGRESS, Section 7.10, OVERTIME AND NIGHT WORK and under specifications SECTION 01100 - PROJECT REQUIREMENTS.

1.07 SPECIFIC PROJECT REQUIREMENTS

- A. Permits – No permits are required.

1.08 COMPREHENSIVE ANNUAL FINANCIAL REPORTING

- A. For any project that involves work on multiple structures, including non-building structures, whether it be new work or renovation work, or when the project involves both site improvements and a structure, the Contractor shall provide the following information to the Contracting Officer for fixed asset allocation purposes:
 - 1. Within 30 calendar days of award as applicable to the project, the following shall be submitted:
 - a. The total cost of each individual structure;
 - b. The total cost of on-site improvement work; and
 - c. The total cost of off-site improvement work.
 - 2. After all work, including all change order work has been completed, and prior to a request for final payment, the following shall be submitted:
 - a. The total cost of each individual structure including any related change order cost;
 - b. The total cost of on-site improvement work including any related change order cost; and
 - c. The total cost of off-site improvement work including any related change order cost.

3. The sum total cost of each category noted above shall total to the contract amount awarded, plus all change order work issued.
 - a. The cost of each individual structure includes the cost of the structure and any work within five (5) feet of the structure or building line which may include, but is not limited to its foundation, foundation earthwork, and utility improvements within and immediately below the building line.
 - b. The on-site improvement cost includes all site improvement work from five (5) feet and beyond the building line and up to the project's property line, which may include but is not limited to clearing and grubbing, grading, drainage system, site utility, walkway, parking lot, and landscape improvements.
 - c. The off-site improvement cost includes all off-site improvement work outside the of the project's property line, which may include but is not limited to walkway, landscape, drainage, utility, and roadway improvements.

PART 2- PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01100 - PROJECT REQUIREMENTS

PART 1 - GENERAL

1.01 WORK COVERED BY CONTRACT DOCUMENTS

- A. Project Identification: Project consists of replacement of electrical panelboards to improve electrical power distribution quantity and quality and replacement of fuel tanks and equipment at existing fueling station.
 - 1. Project Location: See Title Sheet of plans.

- B. The Work includes but is not limited to:
 - 1. Replacement of electrical panelboards with new underground conduit connections.
 - 2. Replacement of fuel tanks and fueling equipment.
 - 3. Replacement of concrete foundation for fuel tanks and equipment.
 - 4. Installation of new fuel management controller with underground telecommunication and electrical connections.
 - 5. Abatement of lead-containing paint with testing and air monitoring.

- C. Perform operations and furnish equipment, fixtures, appliances, tools, materials, related items and labor necessary to execute, complete and deliver the Work as required by the Contract Documents.

- D. The Division and Sections into which these specifications are divided shall not be considered an accurate or complete segregation of work by trades. This also applies to work specified within each section.

- E. Contractor shall not alter the Drawings and Specifications. If an error or discrepancy is found, notify the Contracting Officer.

- F. Specifying of interface and coordination in the various specification sections is provided for information and convenience only. These requirements in the various sections shall complement the requirements of this Section.

1.02 SPECIFICATION FORMATS AND CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 - 1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated and include incomplete sentences. Omission of words or phrases such as “the Contractor shall”, “as shown on the drawings”, “a”, “an”, and “the” are intentional. Omitted words and phrases shall be provided by inference to form complete sentences. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be inferred, as the sense requires. Singular words shall be interpreted as plural, and plural words shall be interpreted as singular

where applicable as the context of the Contract Documents indicates. Where devices, or items, or parts thereof are referred to in the singular, it is intended that such reference shall apply to as many such devices, items or parts as are required to properly complete the Work.

2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by Contractor. Occasionally, the indicative or subjunctive mood may be used in the Section Text for clarity to describe responsibilities that must be fulfilled indirectly by Contractor or by others when so noted.
 - a. The words “shall”, “shall be”, or “shall comply with”, depending on the context, are implied where a colon (:) is used within a sentence or phrase.
3. Abbreviations and Acronyms for Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale Research’s “Encyclopedia of Associations” or in Columbia Books’ “National Trade & Professional Associations of the U.S.”.

B. Terms

1. Directed: Terms such as “directed”, “requested”, “authorized”, “selected”, “approved”, “required”, and “permitted” mean directed by Contracting Officer, requested by Contracting Officer, and similar phrases.
2. Indicated: The term “indicated” refers to graphic representations, notes, or schedules on drawings or to other paragraphs or schedules in specifications and similar requirements in the Contract Documents. Terms such as “shown”, “noted”, “scheduled”, and “specified” are used to help the user locate the reference.
3. Furnish: The term “furnish” means to supply and deliver to project site, ready for unloading, unpacking, assembly, and similar operations.
4. Install: The term “install” describes operations at project site including unloading, temporarily storing, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
5. Provide: The terms “provide” or “provides” means to furnish and install, complete and ready for the intended use.
6. Installer: An installer is the Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-Subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
7. Submit: Terms such as “submit”, “furnish”, “provide”, and “prepare” and similar phrases in the context of a submittal, means to submit to the Contracting Officer.

C. Industry Standards

1. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent

referenced. Such standards are made a part of the Contract Documents by reference.

2. Publication Dates: Comply with standards in effect as of date of the Contract Documents, unless otherwise indicated.
3. Conflicting Requirements: If compliance with 2 or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer uncertainties and requirements that are different, but apparently equal, to Contracting Officer for a decision before proceeding.

1.03 CONTRACT

- A. Refer to Division 1 – General Requirements.
- B. Construction Window:
 1. See 3.01 for Project Schedule.
- C. Project Schedule:

Schedule is presented for information and planning purposes. Dates and activities are subject to adjustments. See Part 3 paragraph titled “Project Schedule”.

1.04 WORK SEQUENCE

- A. The Work will be conducted in a single construction phase.

1.05 USE OF PREMISES AND WORK RESTRICTIONS

- A. General: Contractor shall have full partial use of premises for construction operations. Contractor’s use of premises is limited only by State’s right to perform work or to retain other Contractors on portions of the project site.
- B. Contractor’s use of premises is restricted as follows:
 1. Construction Times and Schedule:
 - a. Night, weekend, holiday and overtime work is not allowed, except with the prior written approval of the Contracting Officer.
 - b. Business hours are considered 7:30 a.m. – 4:00 p.m. on Mondays through Fridays.
 2. Site Access and Parking:
 - a. Parking: Parking for the Contractor’s employees (or Subcontractors) will be limited to the available areas within the designated Project Contract Limits or in areas designated by the Contracting Officer. Do not use parking stalls in regularly designated parking zones within the facility grounds. Unauthorized vehicles parked in marked stalls and in any area outside of the designated project construction site will be subject to towing at the Contractor’s expense.
 - b. Maintain access to the Loading area through Project Contract Limits.
 3. Sanitation: Use of the office toilet facilities is not allowed.

4. Noise and Dust Control:
 - a. In adjacent locations surrounding the project site, noise, dust and other disrupting activities, resulting from construction operations, are detrimental to the conduct of business activities. Therefore, Contractor shall monitor its construction activities. Exercise precaution when using equipment and machinery to keep the noise and dust levels to a minimum.
 - b. To reduce loud disruptive noise levels, ensure mufflers and other devices are provided on equipment, internal combustion engines and compressors.
 - c. Schedule construction activities that create excessive noise and dust problems, such as concrete coring, drilling, hammering, trenching, and demolition, for the weekends, holidays or non-business hours. Overtime costs for the Contractor's employees and work force are the Contractor's responsibility.
 - d. The Contracting Officer will require any construction activity that produces excessive noise and dust shall be performed during non-business hours. The Contracting Officer shall make the final determination. Overtime costs for the Contractor's employees and work force are the Contractor's responsibility.
5. Other Conditions:
 - a. Arrange for construction debris and trash to be removed from project site weekly.
 - b. Operate machinery and equipment with discretion and with minimum interference to driveways and walkways. Do not leave machinery and equipment unattended on roads and driveways.
 - c. Store materials in the areas as designated by the Contracting Officer. Locate construction equipment, machinery, equipment and supplies within the Project Contract Limits.
 - d. Keep access roads and driveways to the project site free of dirt and debris. Provide, erect and maintain lights, barriers, signs, etc. when working on roads, driveways and walkways to protect pedestrians and moped/bicycle riders. Obey facility traffic and safety regulations.
- D. Drug Free Facility: Comply with the ban on smoking and other use of tobacco products, alcoholic beverages and other illegal substances at all times while on the facility campus.

1.06 FUTURE WORK

- A. It is not anticipated the State will award a future contract that depends on the Work under this contract.

1.07 MISCELLANEOUS PROVISIONS

- A. Shoring and Bracing:
 1. The Contractor shall provide temporary shoring and bracing as required for the Work. All costs associated with temporary shoring and bracing shall be borne by the Contractor.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 PROJECT SCHEDULE is presented for information and planning purposes. Dates and activities are subject to adjustments.

NO	EVENT OR DESCRIPTION	REFERENCE OR DATE
1	Pre-Bid Conference and Site Visit (Optional)	September 21 st , 2022 at 9:00 a.m. HST
2	Requests for Information Due	September 27 th , 2022 at 2:00 p.m. HST
3	Responses to Questions and/or Addendum Due	October 7 th , 2022 at 2:00 p.m. HST
4	Bids Due	October 14 th , 2022 at 2:00 p.m. HST
5	Project Start Date	Pre-Construction Meeting
6	Jobsite Start Date	Notice to Proceed
7	Substantial Completion	7.31 Substantial Completion, and Final Inspection
8	Final Completion	12 months from the date indicated in the Notice to Proceed from the Department

END OF SECTION

SECTION 01320 – CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Contractor's Construction Schedule.
 - 2. Submittals Schedule.
 - 3. Schedule of Prices.
 - 4. Payment Application.
- B. Related Sections include the following:
 - 1. Section 01330 – Submittal Procedures for submitting schedules and reports.

1.02 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical activities are activities on the critical path and control the total length of the project. They must start and finish on the planned early start and finish times.
 - 2. Predecessor activity is an activity that must be completed before a given activity can be started.
- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of project.
- C. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Event: The starting or ending point of an activity.
- E. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either the Department or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.

- F. Schedule of Prices: A statement furnished by Contractor allocating portions of the Contract Price to various portions of the Work and used as the basis for reviewing Contractor's Payment Applications.

1.03 SUBMITTALS

- A. Required Submittals: Unless otherwise noted, electronically submit the list of the required submittals, by Specification Section, within 15 days after award of the contract or upon earlier written instructions from the Contracting Officer.
 - 1. The listing shall indicate and include the following:
 - a. The number of copies required for submittal.
 - b. Planned submittal date.
 - c. Approval date required by the Contractor.
 - d. A space where the "date of submittal" can be inserted.
 - e. A space where the "date of approval" can be inserted.
 - f. A space where an "action code" can be inserted.
- B. Construction Schedule: Electronically submit the Construction Schedule for review within 15 days after the award of the contract or upon earlier written instructions from the Contracting Officer.
- C. Schedule of Prices: Electronically submit the Schedule of Prices integrated with the Construction Schedule for review within 15 days after the award of the contract or upon earlier written instructions from the Contracting Officer.
- D. Payment Application: Submit the payment application at earliest possible date and no sooner than the last day of the month after all payroll affidavits, updated submittal registers, and schedules have been submitted.
 - 1. Use the Department's forms for Payment applications.

1.04 COORDINATION

- A. Coordinate preparation and processing of schedules and reports with performance of construction activities and with scheduling and reporting of separate Contractors.
- B. Construction Schedule: Coordinate Contractor's Construction Schedule with the Schedule of Prices, Submittals Schedule, loaded monthly event activity, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from parties involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.
- C. Schedule of Prices: Coordinate preparation of the schedule with preparation of Contractor's Construction Schedule.

1. Correlate line items in the Schedule of Prices with other required administrative forms and schedules, including the following:
 - a. The Department's Payment Application form and the Construction Progress Report continuation sheet for the event cost estimate per time period.
 - b. Submittals Schedule.

PART 2 - PRODUCTS

2.01 SUBMITTALS SCHEDULE

- A. Comply with Division 1 - General Requirements. Furnish required submittals specified in this Section and in the Technical Sections. Submittals include one or more of the following: shop drawings, color samples, material samples, technical data, material safety data information, schedules of materials, schedules of operations, guarantees, certifications, operating and maintenance manuals, and field posted as-built drawings.
- B. Preparation: Furnish a schedule of submittals per Contracting Officer.
 1. Coordinate Submittals Schedule with list of subcontracts, the Schedule of Prices, and Contractor's Construction Schedule.
 2. The schedule shall accommodate a minimum of 21 [25] calendar days for the State's review, as applicable for the Island the project is located.
 3. Prepare and submit an updated list to the Contracting Officer at monthly intervals or as directed by the Contracting Officer. The listing shall reflect all approvals received since the last update.

2.02 CONTRACTOR'S CONSTRUCTION SCHEDULE - GANTT CHART METHOD

- A. The construction schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. The progress chart shall indicate the order in which the Contractor contemplates starting and completing the several salient features of the work (including acquiring materials, plant, and equipment).
- B. Upon completion of the Contracting Officer's review, the Contractor shall amend the schedule as necessary to reflect the comments. If necessary, the Contractor shall participate in a meeting with the Contracting Officer to discuss the proposed schedule and changes required. Submit the revised schedule for review within 7 calendar days after receipt of the comments.
- C. Use the reviewed schedule for planning, organizing and directing the work, for reporting progress, and for requesting payment for the work completed. Unless providing an update, do not make changes to the reviewed schedule without the Contracting Officer's approval.
- D. If, in the opinion of the Contracting Officer, the Contractor falls behind the approved schedule, the Contractor shall take steps necessary to improve progress, including those that may be required by the Contracting Officer, without additional cost to the State. The Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, or amount of construction plant, and to submit for approval any

supplemental schedule or schedules in chart form as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.

- E. Update the construction schedule at monthly intervals or when directed by the Contracting Officer to revise the schedule. Reflect any changes occurring since the last update with each invoice for progress payment. Submit copies of the purchase orders and confirmation of the delivery dates as directed. The Contracting Officer's review of the updated schedule is to check that the updated schedule does not alter the construction performance period unless the period was revised through a change order or contract modification.

2.03 SCHEDULE OF PRICES

- A. Furnish a schedule of prices per Contracting Officer.
- B. Provide a breakdown of the Contract Sum in enough detail to facilitate developing and the continued evaluation of Payment Applications. Provide several line items for principal subcontract amounts, or for materials or equipment purchased or fabricated and stored, but not yet installed, where appropriate. Round amounts to nearest whole dollar; total shall equal the Contract Price.
- C. Each item in the Schedule of Prices and Payment Application shall be complete. Include total cost and proportionate share of general overhead and profit for each item.

2.04 PAYMENT APPLICATION

- A. Use the Schedule of Prices as the Monthly Construction Progress Report. Each Payment Application shall be consistent with previous applications and payments. The Contracting Officer shall determine the appropriateness of each payment application item.
- B. Payment Application Times: The date for each progress payment is the last day of each month. The period covered by each Payment Application starts on the first day of the month or following the end of the preceding period and ends on the last day of the month.
- C. Updating: Update the schedule of prices listed in the Payment application when Change Orders or Contract Modifications result in a change in the Contract Price.
- D. Provide a separate line item for each part of the Work where Payment Application may include materials or equipment purchased or fabricated and stored, but not yet installed.
- E. Differentiate between items stored on-site and items stored off-site. Include evidence of insurance or bonded warehousing if required.
- F. Provide separate line items for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
- G. Payment Application Forms: Use and submit copies of the Payment Application and Construction Progress forms provided by Department. Furnish 1 copy.
- H. Application Preparation: Complete every entry on form. Execute by a person authorized to sign legal documents on behalf of the Contractor.

1. Entries shall match data on the Schedule of Prices and Contractor's Construction Schedule. Use updated schedules if revisions were made. Include amounts of Change Orders and Contract Modifications issued before last day of construction period covered by application.
- I. No payment will be made until the following are submitted electronically each month:
 1. Monthly Estimate, 1 original.
 2. Monthly Progress Report, 1 copy.
 3. Statement of Contract Time, 1 copy.
 4. Updated Submittal Register, 1 copy.
 5. Updated Progress Schedule, 1 copy.
 6. All Daily Reports, 1 copy.
 7. All Payroll Affidavits for work done, 1 copy.
 - J. Retainage: The Department will withhold retainage in compliance with Division 1 – General Requirements.
 - K. Transmittal: Electronically submit the signed original Payment Application for processing.

2.05 GENERAL CONTRACTOR AND SUBCONTRACTORS DAILY PROGRESS REPORTS

- A. The General Contractor is responsible for submitting the General Contractor and Subcontractor Daily Progress Reports (Daily Reports) for the General Contractor, all subcontractors, and any lower-tier subcontractors.
- B. The form of the Daily Reports shall be as directed by the Contracting Officer. A separate report shall be made and submitted for the General Contractor (each calendar day) and each subcontractor (each day worked). The report shall include the following information for each employer: Name of General Contractor or Subcontractor, Report Number, Contract Day (consecutive calendar day from Notice to Proceed (NTP) Date), Date worked, work location and description, number of workers, trade/labor classification, and work hours. For General Contractor, only the Contract Day is required because the Report Number will be the same number.
- C. The Daily Reports shall be prepared from the project NTP Date. Daily Reports shall continue to be prepared and submitted up to the Project Acceptance Date. After the Project Acceptance Date, Daily Reports will be submitted for days worked only, and continue to date of Contract Completion Notice. Running Contract Day will stop at Project Acceptance Date.
- D. Submit/upload copies of the previous day's reports to the appropriate online folder(s) within the State's web based construction management system as directed by the Contracting Officer by 10:00 a.m. of the next working day.

- E. Daily Reports can be handwritten in the field, and shall be uploaded by the General Contractor to the State's web-based construction management system. The reports shall use the following file naming convention:

CN R# CD# YYMMDD

CN: Company Name of General Contractor or Subcontractor (2 capital letters)

R#: Daily Report number (3 digits, used only by Subcontractor)

CD#: Contract Day (consecutive calendar day from NTP Date, 3 digits)

YYMMDD: Report Date in numerals (year, month, day, 6 digits)

Examples: HS 011 015 170314, for Honolulu Subcontractor, Inc.

 HG 015 170314, for Honolulu General Contractor, Inc.

- F. A sample Daily Progress Report Form can be found at the end of this Section.

PART 3 - EXECUTION (Not Used)

STATE OF HAWAII, DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION – MAUI DISTRICT DAILY PROGRESS REPORT		REPORT NO.	
		CONTRACT DAY:	
		DATE:	
PROJECT:			DOT Job No.:
Contractor:		State Engineer:	
Certified by:		State Inspector:	
Weather:		Condition:	
WORK PERFORMED TODAY (by General Contractor or Subcontractor)			
Work location & description	Number (Workers)	Trade/Labor Classification	Hours
Observed defective work:			
Observed corrected work:			
Materials and equipment delivered today:			
Testing done today:			
Questions or problems:			
Remarks:			

END OF SECTION

SECTION 01330 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

- A. Comply with Division 1 - General Requirements.
- B. This Section includes administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other miscellaneous submittals.
- C. Related Sections include the following:
 - 1. Section 01320 – Construction Progress Documentation for submitting schedules and reports, including Contractor’s Construction Schedule and the Submittals Schedule.
 - 2. Section 01770 – Closeout Procedures for submitting warranties, project record documents and operation and maintenance manuals.

1.02 SUBMITTAL PROCEDURES

- A. Coordinate Work and Submittals: Contractor shall certify the submittals were reviewed and coordinated.
- B. Submittal Certification: Provide in MS Word when submitting electronically. Contracting Officer will provide an electronic copy of the Submittal Certification. Provide a reproduction (or stamp) of the “Submittal Certification” and furnish the required information with all submittals. Include the certification on:
 - 1. The title sheet of each shop drawing, or on
 - 2. The cover sheet of submittals in 8-1/2 inch x 11-inch format, or on
 - 3. One face of a cardstock tag (minimum size 3-inch x 6-inch) tied to each sample. On the sample tag, identify the sample to ensure sample can be matched to the tag if accidentally separated. The opposite face of the tag will be used by the Contracting Officer to receive, review, log stamp and include comments.
- C. Variances: The Contractor shall request approval for a variance. Clearly note any proposed deviations or variances from the Specifications, Drawings, and other Contract Documents on the submittal and also in a separately written letter accompanying the submittal.

D. Submittal Certification Form (stamp or digital)

CONTRACTOR'S NAME: _____
PROJECT: _____
DOE JOB NO: _____

As the General Contractor, we checked this submittal and we certify it is correct, complete, 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.

SUBMITTAL NUMBER _____ DATE RECEIVED _____
REVISION NUMBER _____ DATE RECEIVED _____
SPECIFICATION SECTION NUMBER /PARAGRAPH NUMBER _____
DRAWING NUMBER _____
SUBCONTRACTOR'S NAME _____
SUPPLIER'S NAME _____
MANUFACTURER'S NAME _____

NOTE: DEVIATIONS FROM THE CONTRACT DOCUMENTS ARE PROPOSED AS FOLLOWS (Indicate "NONE" if there are no deviations)

CERTIFIED BY	

Note: Form can be combined with Design Consultant's Review stamp. This is available from the Contracting Officer.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 SUBMITTAL REGISTER AND TRANSMITTAL FORM

- A. Contractor shall use submittal register and transmittal forms as directed by the Contracting Officer.
- B. The listing of required submittals within this Section is provided for the Contractor's convenience. Review the specification technical sections and prepare a comprehensive listing of required submittals. Furnish submittals to the Contracting Officer for review.
- C. Contractor shall separate each submittal item by listing all submittals in the following groups with the items in each group sequentially listed by the specification section they come from:
 - 1. Administrative
 - 2. Data
 - 3. Tests

4. Closing

- D. Contractor shall separate all different types of data as separate line items all with the column requirements.
- E. Contractor shall send monthly updates and reconciled copies electronically to the Contracting Officer and the Design Consultant in MS Word or MS Excel or another format as accepted by the Contracting Officer.

Listing of Required Submittals
(Refer to 3.01 B in this Section.)

Section No. - Title	Shop Drawings & Diagrams	Samples	Certificates (Material, Treatment, Applicator, etc.)	Product Data, Manufacturers' Technical Literature/Brochures	SDS Sheets	Calculations	Reports (Testing, Maintenance, Inspection, etc.)	Test Plan	O & M Manual	Equipment or Fixture Listing	Schedules (Project Installation)	Maintenance Service Contract	Field Posted As-Built Drawings	Others	Guaranty or Warranty	Manufacturer' s Guaranty or Warranty (Greater than one year)
01320 – Construction Progress Documentation											■			■		
01500 – Temporary Facilities and Controls	■						■							■		
01567 – Environmental Protection				■	■		■									
01770 – Closeout Procedures	■						■		■			■	■	■	■	■
02070 – Selective Demolition														■		
02200 – Earthwork			■	■			■									
02370 – Sediment and Erosion Control				■	■									■		
02510 – Asphaltic Concrete Paving			■	■	■		■									

(See next page for continuation.)

List of Required Submittals (continued)

Section No. - Title	Shop Drawings & Diagrams	Samples	Certificates (Material, Treatment, Applicator, etc.)	Product Data, Manufacturers' Technical Literature/Brochures	SDS Sheets	Calculations	Reports (Testing, Maintenance, Inspection, etc.)	Test Plan	O & M Manual	Equipment or Fixture Listing	Schedules (Project Installation)	Maintenance Service Contract	Field Posted As-Built Drawings	Others	Guaranty or Warranty	Manufacturers Guaranty or Warranty (Greater than one year)
02577 Pavement Markings and Signage	■		■	■	■									■		
03300 – Cast-in-Place Concrete	■		■	■			■						■	■		
13282 – Lead-Containing Paint Control Measures	■	■	■	■	■		■			■	■			■		
13290– Contaminated Media and Hazardous Materials			■											■		
15193 – Fuel Systems (Gasoline /Diesel)	■		■	■	■		■	■	■				■	■	■	■
16100 – Electrical Work	■		■	■			■		■				■	■	■	
16301 – Underground Electrical Work	■		■	■			■						■	■	■	

END OF SECTION

SECTION 01500 – TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.01 SUMMARY

- A. Requirements for temporary facilities and controls, including temporary utilities, support facilities, and security and protection facilities.
- B. Temporary utilities may include but are not limited to, the following:
 - 1. Fueling facilities.
 - 2. Storm drainage.
 - 3. Water service and distribution.
 - 4. Sanitary facilities, including portable toilets and wash facilities.
 - 5. Ventilation.
 - 6. Electric power service.
 - 7. Lighting.
- C. Support facilities may include, but are not limited to, the following:
 - 1. Project signs.
 - 2. Field offices.
 - 3. Trash, refuse disposal.
 - 4. Erosion controls and site drainage.
 - 5. Lifts and hoists.
 - 6. Construction aids and miscellaneous services and facilities.
- D. Security and protection facilities and measures may include, but are not limited to, the following:
 - 1. Environmental protection.
 - 2. Stormwater control.
 - 3. Tree and plant protection.
 - 4. Interior and exterior construction site/area enclosure fencing.
 - 5. Interior and exterior construction site/area barricades, warning signs, and lights.
- E. Related Sections: Refer to Divisions 2 through 16 for other temporary requirements including ventilation, humidity requirements and products in those Sections.

1.02 USE CHARGES

- A. General: Cost or use charges for temporary facilities are not chargeable to the State and shall be included in the Contract Price. Allow other entities to use temporary services and facilities without cost, including, but not limited to, the following:
 - 1. Other Contractors with agreements with the State working within the contract limits.
 - 2. Occupants of Project.
 - 3. Testing agencies.
 - 4. Contracting Officer and personnel of authorities having jurisdiction.

1.03 SUBMITTALS

- A. Submit in accordance with Section 01330 Submittal Procedures.
- B. Manufacturer's product literature: Submit manufacturer's product literature including description of material, physical properties, instructions for operation and Material Safety Data Sheets.
- C. Work Restrictions: Prepare a work restrictions submittal indicating the following:
 - 1. Location(s) of loading and unloading for large deliveries or materials.
 - 2. Staging area(s).
 - 3. Portable toilet(s) location(s).
 - 4. Location of exterior construction barricades and types of systems used for the barricades.
 - 5. Locations of interior plastic zip wall type barricades and/or construction barricades.
 - 6. Extent floor protection (i.e., ram boards).
 - 7. Warning and other temporary sign locations.
 - 8. Temporary project sign details.
- D. Temporary Utility Reports: If requested by the Contracting Officer, submit reports of tests, inspections, meter readings, and similar procedures performed on temporary utilities.
- E. Landfill Disposal Receipts: If requested by the Contracting Officer, submit copies of receipts issued by a landfill facility. Include receipts with Contractor Daily Progress Report.

1.04 QUALITY ASSURANCE

- A. Standards: Comply with IBC Chapter 33, "Safeguards During Construction", ANSI A10.6, NECA's "Standard for Installing and Maintaining Temporary Electric Power at Construction Sites", and NFPA 241, "Standard for Safeguarding Construction, Alteration, and Demolition Operations".

1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with trade regulations and union jurisdictions.
2. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70, "National Electrical Code".
 - a. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.05 PROJECT CONDITIONS

- A. Temporary Utilities: At earliest feasible time, when acceptable to the Contracting Officer, change over from use of temporary service to use of permanent service.
 1. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Contracting Officer's acceptance, regardless of previously assigned responsibilities.
- B. Conditions of Use: The following conditions apply to use of temporary services and facilities by all parties engaged in the Work:
 1. Keep temporary services and facilities clean and neat.
 2. Relocate temporary services and facilities as required by progress of the Work.

1.06 PREPARATION AND PROTECTION

- A. Protection of Property: Continually maintain adequate protection of the Work from damage and protect all property, including but not limited to buildings, equipment, furniture, grounds, vegetation, irrigation, material, utility systems located at and adjoining the job site. Repair, replace or pay the expense to repair damages resulting from Contractor's fault or negligence.
- B. Before starting work to be applied to previously erected constructions, make a thorough and complete investigation of the recipient surfaces and determine their suitability to receive required additional construction and finishes. Make any repair that is required to properly prepare surfaces, and coordinate the Work to provide a suitable surface to receive following Work.
- C. Commencing work by any trade implies acceptance of existing conditions and surfaces as satisfactory for the application of subsequent work, and full responsibility for finished results and assumption of warranty obligations under the Contract.
- D. Protect existing (including interiors) work to prevent damage by vandals or the elements. Provide temporary protection. Use curtains, barricades, or other appropriate methods. Take positive measures to prevent breakage of glass and damage to plastic, aluminum and other finishes.
- E. Repairs and Replacements: Promptly replace and repair damages to the approval of the Contracting Officer. Additional time required to secure replacements and to make repairs does not justify a time extension.

F. Protection of Personnel

1. During the demolition work the Contractor shall continuously evaluate the condition of the item being demolished and take immediate action to protect all personnel working in and around the demolition site. No area, section, or component of roofs, walls, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.
2. Provide temporary barricades and other forms of protection as required to protect the personnel or the general public from injury due to selective demolition work
3. Life safety procedures and provisions shall be in conformance with all applicable Federal, State and County regulations including those of the State of Hawaii Occupational Safety and Health.
4. Remove protections at completion of work.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. General: Provide new materials. Undamaged, previously used materials in serviceable condition may be used if approved by Contracting Officer. Provide materials suitable for use intended.
- B. Portable Chain Link Fencing: Minimum 2 inch 9 gage, galvanized steel, chain link fabric fencing; minimum 6-feet high with galvanized steel pipe posts; minimum 2 3/8 inch OD line posts and 2 7/8 inch OD corner and pull posts, with 1 5/8 inch OD top and bottom rails. Provide concrete or galvanized steel bases for supporting posts.
- C. Wood Enclosure Fence: Plywood, 6-feet high, framed with four 2 by 4 inch rails, with preservative treated wood posts spaced not more than 8-feet apart.
 1. Lumber and Plywood: Comply with requirements in Section 06100 – Rough Carpentry.
- D. Plastic Enclosure Fence: Industry standard 4-feet high plastic fencing with metal (or wood) post supports at 10-feet on center connected with a top and bottom 12-gauge soft annealed galvanized tie wires securely connected to posts. Posts shall be capable of resisting a lateral load of 100 pounds measured at the top of the post.
- E. Temporary Roofing: Standard weight, mineral surfaced, asphalt shingles or asphalt impregnated and coated, mineral surfaced, roll roofing sheet or other temporary roofing material(s) as authorized by the Contracting Officer.
- F. Gypsum Board: Minimum 1/2-inch thick by 48-inches wide by maximum available lengths; regular type [fire rated Type X] panels with tapered edges complying with ASTM C 36.
- G. Insulation: Unfaced mineral fiber blanket, manufactured from glass, slag wool, or rock wool; or aluminum faced bubble wrap insulation radiant barrier with maximum flame spread and smoke developed indices of 25 and 50, respectively.

- H. Paint: Comply with requirements in SECTION 09900 – Paints and Coatings.
- I. Tarpaulins: Fire resistive labeled with flame spread rating of 15 or less.
- J. Water: Potable.

2.02 EQUIPMENT

- A. Field Offices (If applicable)
 - 1. Prefabricated or job built construction with lockable entrances, operable windows, and serviceable finishes; air conditioned; insulated; 90-inch minimum height to ceiling; and on foundations adequate for normal office loading.
 - 2. Provide the following for job built construction:
 - a. Light gage steel or wood stud grade framing and fire treated plywood or non-combustible composite panels.
 - 1) Interior painting required; exterior painting not required.
 - 2) Roofs: Metal sheet, asphalt shingles or roll roofing and insulated or with radiant barriers.
 - 3) Door Hardware: Same as provided elsewhere on the construction project.
- B. Self-Contained Combination Toilet and Urinal Units: Single occupant units of chemical, aerated recirculation, or combustion type; vented; fully enclosed with a glass fiber reinforced polyester shell or similar nonabsorbent material. One quarter of, or at least one unit(s) shall contain a handwash sink with potable water storage.

PART 3 - EXECUTION

3.01 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.
 - 1. Secure approval from Contracting Officer before modifications are made to the State Inspector's Field Office.
- B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.02 TEMPORARY UTILITY INSTALLATION

- A. General: Engage appropriate local utility company to install temporary service or connect to existing service where directed by the Contracting Officer. Where utility company provides only part of the service, provide the remainder with matching, compatible materials and equipment. Comply with utility company recommendations.
 - 1. Arrange with utility company, the Department, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
 - 2. Provide adequate capacity at each stage of construction. Before temporary utility is available, provide trucked in services.

- B. Storm Drainage: Drainage due to construction related activities into any storm drain and any major water runoff from the project site is prohibited.
- C. Water Service: Where directed by the Contracting Officer, make arrangements with the utility company for temporary use of water, and pay for all expenses. However, at the option of the Contractor, a temporary tap into the facility's existing water system is allowed, subject to the following conditions:
 - 1. Comply with the Department of Health's and County water provider's requirements when tapping into the existing water system.
 - 2. Reasonable amounts of water will be available without charge. Excessive use (as determined by the Contracting Officer) of water will eliminate the Contractor's temporary use of the existing water system.
 - 3. Should the Contractor at any time fail to comply with any or all of the above conditions, the Department may terminate the use of water. The Contractor shall remove the hookup within 48 hours of notification of such termination.
- D. Sanitary Facilities: Provide temporary toilets. Comply with regulations and health codes for type, number, location, operation, and maintenance.
 - 1. Disposable Supplies: Provide toilet tissue, paper towels, paper cups, and similar disposable materials for each facility. Maintain adequate supply. Provide covered waste containers for disposal of used material.
 - 2. Wash Facilities: If necessary, install wash facilities supplied with potable water at convenient locations for personnel who handle materials that require wash up. Dispose of drainage properly. Supply cleaning compounds appropriate for each type of material handled.
 - a. If necessary, provide safety showers, eyewash fountains, and similar facilities for convenience, safety, and sanitation of personnel.
 - 3. Locate temporary toilets so personnel need not walk more than 2 stories vertically or 200-feet horizontally to facilities.
- E. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
- F. Electric Power Service: Use of State facilities electrical power services will be permitted as long as equipment is maintained in a condition acceptable to the Contracting Officer.
- G. Electric Distribution: Provide receptacle outlets adequate for connection of power tools and equipment. Protect wiring, in conduits or other, measures when exposed to possible damage or traffic areas.
- H. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations.

3.03 SUPPORT FACILITIES INSTALLATION

- A. General: Comply with the following:
 - 1. Locate field offices, storage sheds, sanitary facilities, and other temporary construction and support facilities for easy access as directed by the Contracting Officer.
 - 2. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion.
 - 3. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to State.
- B. Traffic Controls: Provide temporary traffic controls at junction of temporary roads with public roads. Include warning signs for public traffic and "STOP" signs for entrance onto public roads. Comply with requirements of authorities having jurisdiction.
- C. Site Drainage
 - 1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining property nor endanger permanent Work or temporary facilities.
 - 2. Before connection and operation of permanent drainage piping system, provide temporary drainage where roofing or similar waterproof deck construction is completed.
- D. Project Sign and Temporary Sign(s)
 - 1. Provide and install project identification sign and other signs as listed. Sign designs are attached to Part 3 of this Section:
 - a. Project Sign.
 - b. Warning Sign.
 - 2. Install signs where directed by the Contracting Officer or where indicated to inform public and persons seeking entrance to the Project. Do not permit installation of unauthorized signs.
 - 3. Provide temporary signs to provide directional information to construction personnel and visitors.
 - 4. Construct signs with durable materials, properly supported or mounted, and visible.
- E. Trash, Refuse Disposal
 - 1. Department of Health – Illegal Dumping Notice. See attachment to Part 3 of this Section.
 - a. This Notice to be printed out on 8.5" x 11" paper.
 - b. This Notice to be posted at the job site field office and/or in locations visible to all contractors, subcontractors, suppliers, vendors, etc. throughout the duration of the project.
 - 2. Illegal Dumping of solid waste could subject the Contractor to fines and could lead to felony prosecution in accordance with Chapter 342H, HRS. For more information,

see the following web site:

<http://www.hawaii.gov/health/environmental/waste/sw/pdf/llldump.pdf>.

3. Provide waste collection containers in sizes adequate to handle waste from construction operations. Containerize and clearly label hazardous, dangerous, or unsanitary waste materials separately from other waste.
 4. Do not burn debris or waste materials on the project site.
 5. Do not bury debris or waste material on the project site unless specifically allowed elsewhere in these specifications as backfill material.
 6. Haul unusable debris and waste material to an appropriate off-site dump area.
 - a. Water down debris and waste materials during loading operations or provide other measures to prevent dust or other airborne contaminants.
 - b. Vacuum, wet mop, or damp sweep when cleaning rubbish and fines which can become airborne from floors or other paved areas. Do not dry sweep.
 - c. Use enclosed chutes or containers to conveying debris from above the ground floor level.
 7. Clean up shall include the collection of all waste paper and wrapping materials, cans, bottles, construction waste materials and other objectionable materials, and removal as required. Frequency of clean up shall coincide with rubbish producing events.
- F. Janitorial Services: Provide janitorial services on a weekly basis for the Contracting Officer's field office, first aid stations, toilets, wash facilities, lunchrooms, and similar areas.

3.04 ENVIRONMENTAL CONTROLS

- A. General: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- B. Dust Control
 1. Prevent dust from becoming airborne at all times including non-working hours, weekends and holidays in conformance with the State Department of Health, Administrative Rules, Title 11, Chapter 60.1 Air Pollution Control.
 2. Contractor is responsible for and shall determine the method of dust control. Subject to the Contractor's choice, the use of water or environmentally friendly chemicals may be used over surfaces that create airborne dust.
 3. Contractor is responsible for all damage claims due to their negligence to control dust.
- C. Noise Control
 1. Keep noise within acceptable levels at all times in conformance with the State Department of Health, Administrative Rules, Title 11, Chapter 46 Community Noise

Control. Obtain and pay for the Community Noise Permit when construction equipment or other devices emit noise at levels exceeding the allowable limits.

2. Ensure mufflers and other devices are provided on equipment, internal combustion engines and compressors to reduce loud disruptive noise levels and maintain equipment to reduce noise to acceptable levels.
3. Unless specified elsewhere, do not start construction equipment that meet allowable noise limits prior to 6:45 A.M. or equipment exceeding allowable noise levels prior to 7:00 A.M.

D. Tree and Plant Protection: Protect vegetation from construction damage. Protect existing landscaping, irrigation and tree root systems from damage, flooding, and erosion due to construction activity. Repair any damage to vegetation and irrigation system.

3.05 BARRICADES AND ENCLOSURES

A. Barricades: Before construction operations begin, erect temporary construction barricade(s) to prevent unauthorized persons from entering the project area and to the extent required by the Contracting Officer.

1. Maintain temporary construction barricade(s) throughout the duration of the Work. During the course of the project, the Contracting Officer may require additional barricades be provided for the safety of the public. Contractor shall erect the additional barricade(s) at its own expense.
2. Construction barricades may consist of:
 - a. Portable chain link fencing.
 - b. Wood barriers at 6' high.
 - c. Interior plastic zip walls.
 - d. Plastic fencing.

B. Security Enclosure and Lockup:

1. Install substantial temporary enclosure around partially completed areas of construction.
2. If necessary, provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security.

C. Temporary Enclosures

1. Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior and to protect building interior. Contractor shall pay for all damage to the building interior caused by the Contractor's failure to install an adequate temporary weathertight enclosure.

2. Where cooling is needed and permanent enclosure is not complete, provide insulated temporary enclosures. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.

D. Opening Protection

1. Vertical Openings: Close openings with plywood or similar materials.
2. Horizontal Openings: Close openings in floor or roof decks and horizontal surfaces with load bearing, wood framed construction.
3. Where temporary wood or plywood enclosure exceeds 100 sq. ft. in area, use fire retardant treated material for framing and main sheathing.

E. Temporary Partitions: Erect and maintain dustproof partitions and temporary enclosures to limit dust and dirt migration and to separate areas from fumes and noise.

1. Construct dustproof partitions of not less than nominal 4 inch studs, 5/8 inch gypsum wallboard with joints taped on occupied side, and 1/2 inch fire retardant plywood on construction side.

3.06 TEMPORARY FIRE PROTECTION

A. If necessary and/or as directed by the Contracting Officer, install and maintain temporary fire protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241.

1. Store combustible materials in containers in fire safe locations.
2. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, stairways, and other access routes for firefighting. Prohibit smoking in hazardous fire exposure areas.
3. Supervise welding operations, combustion type temporary heating units, and similar sources of fire ignition.
4. Permanent Fire Protection: At earliest feasible date in each area of Project, complete installation of permanent fire protection facility, including connected services, and place into operation and use. Instruct key personnel on use of facilities.

3.07 OPERATION, TERMINATION, AND REMOVAL

A. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage caused by heat temperatures and similar elements.

B. Termination and Removal: Remove each temporary facility when need for its service has ended, or when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are the property of Contractor. The Department reserves the right to take possession of Project identification signs.

3.08 ATTACHMENTS

- A. Project Sign Drawings
 - 1. Standard Detail for Project Sign Layout - DETAIL A/TG 01500.
 - 2. Standard Detail for Project Sign Specifications - DETAIL B/TG 01500.
 - 3. Standard Detail for Project Sign Details - DETAIL C/TG 01500.
- B. Dust Control Fence Drawings: Standard Detail for Dust Control Fence - DETAILS D and E/TG 01500.
- C. Warning Sign: Requirements for Warning Sign.
- D. Department of Health – Illegal Dumping Notice.

LETTER STYLE

COPY IS CENTERED AND SET IN ADOBE TYPE FUTURA HEAVY. IF THIS SPECIFIC TYPE IS NOT AVAILABLE, FUTURA DEMI BOLD MAY BE SUBSTITUTED. COPY SHOULD BE SET AND SPACED BY A PROFESSIONAL TYPESETTER AND ENLARGED PHOTOGRAPHICALLY FOR PHOTO STENCIL SCREEN PROCESS.

ART WORK

CONSTANT ELEMENTS OF THE SIGN LAYOUT – FRAME, OUTLINE, STRIPE, AND OFFICIAL STATE INFORMATION – MAY BE DUPLICATED FOLLOWING WORKING DRAWING MEASUREMENTS, OR BE REPRODUCED AND ENLARGED PHOTOGRAPHICALLY USING A LAYOUT TEMPLATE IF PROVIDED. THE "STATE OF HAWAII" MASTHEAD SHOULD BE REPRODUCED AND ENLARGED AS SPECIFIED, USING THE ARTWORK AS SHOWN.

TITLES

THE SPECIFIC MAJOR WORK OF THE PROJECT UNDER CONSTRUCTION IS EMPHASIZED BY USING 3 3/4" TYPE, ALL CAPITALS. SECONDARY INFORMATION SUCH AS LOCATIONS OR BUILDINGS USES 2 1/4" TYPE, ALL CAPITALS. OTHER RELATED INFORMATION OF LESSER IMPORTANCE USES 2 1/4" (CAPITAL HEIGHT) IN LOWER CASE LETTERS. ALL LINES OF TYPE SHOULD NOT EXCEED THE WIDTH OF THE 6'-2" STRIPE.

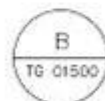
MATERIALS

PANEL IS 3/4" EXTERIOR GRADE HIGH DENSITY OVERLAID PLYWOOD, WITH RESIN BONDED SURFACES ON BOTH SIDES.

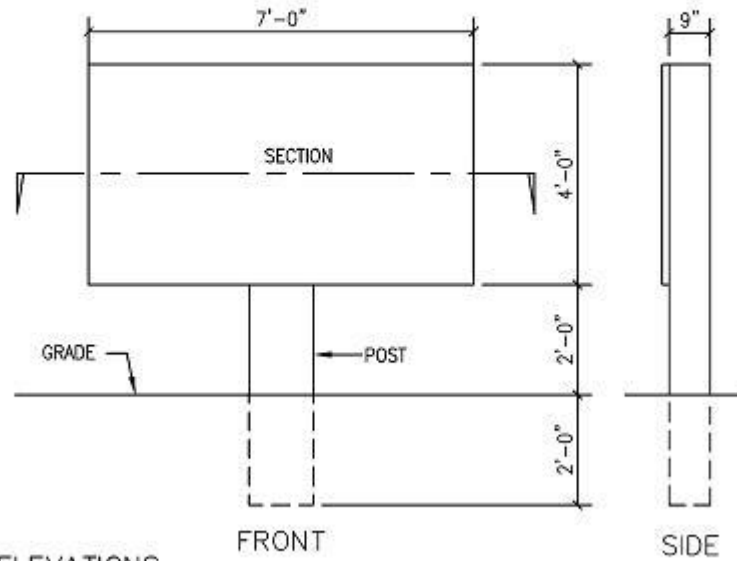
PAINTS & INKS

SCREEN PRINT INKS ARE MATTE FINISH. PAINTS ARE SATIN FINISH, EXTERIOR GRADE. REFERENCES TO AMERITONE COLOR KEY PAINT ARE FOR COLOR MATCH ONLY.

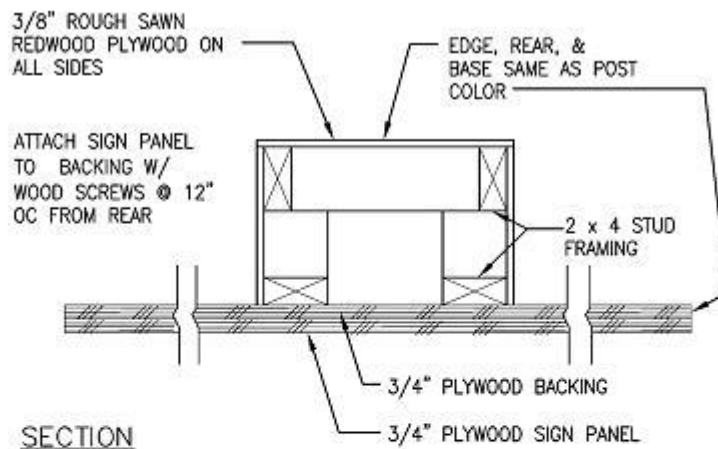
COLOR:	1.	1BL10A	BOHEMIAN BLUE
	2.	2H16P	SOFTLY (WHITE)
	3.	2VR2A	HOT TANGO (RED)
	4.	1M52E	TOKAY (GRAY)



PROJECT SIGN SPECIFICATIONS



ELEVATIONS

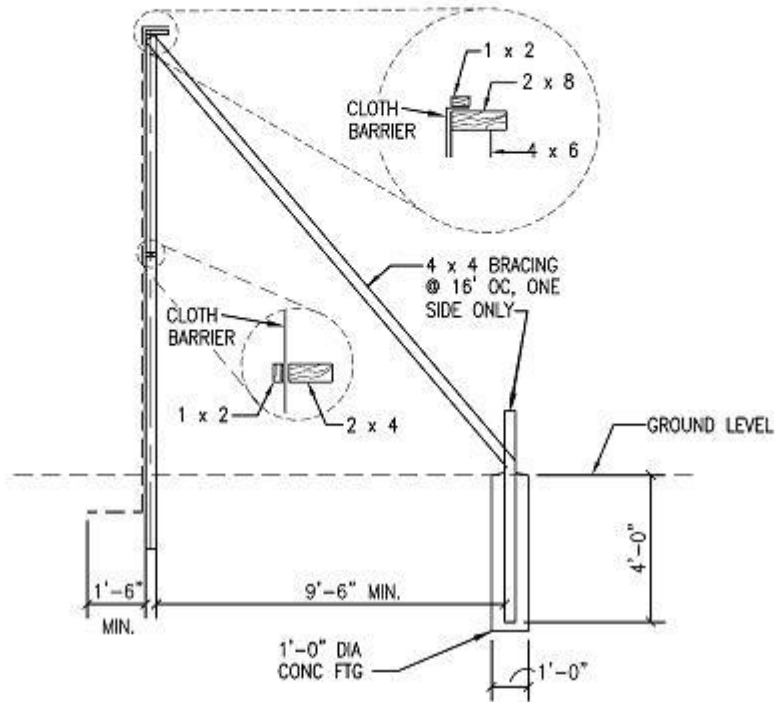


SECTION



PROJECT SIGN DETAILS

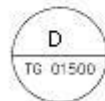
SCALE: NTS



SECTION

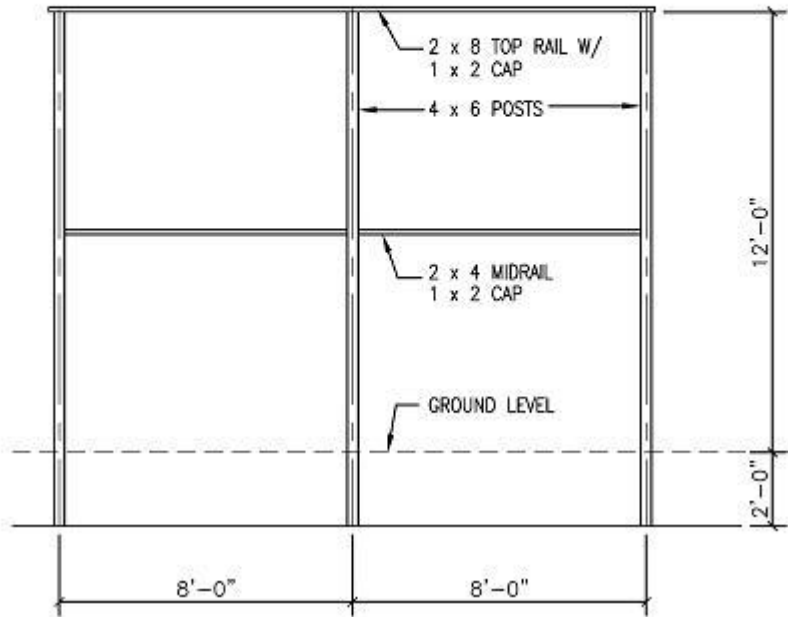
NOTES:

1. CLOTH BARRIER NOT SHOWN IN FRONT VIEW.
2. CLOTH BARRIER TO BE "GEOTEXTILE" OR "NURSERY SHADE".
3. LUMBER SIZES ARE NOMINAL INCHES.
4. AS SHOWN CLOTH TO BE BURIED AT BASE TO INDICATED DIMENSION.
5. 1 x 2 CLOTH BARRIER CAPS TO BE NAILED @ 12" OC.
6. BURLAP IS NOT ACCEPTABLE AS THE CLOTH BARRIER.
7. CLOTH TO HAVE NO HORIZONTAL SEAMS.
8. VERTICAL SEAMS TO BE MADE OVER UPRIGHTS ONLY.
9. ALL SEAMS TO BE CAPPED WITH MINIMUM 1 x 2.
10. ALL JOINTS TO BE SECURELY FASTENED BY MECHANICAL MEANS.



STANDARD DETAIL FOR
DUST CONTROL FENCE

SCALE: NTS



ELEVATION

NOTES:

1. CLOTH BARRIER NOT SHOWN IN FRONT VIEW.
2. CLOTH BARRIER TO BE "GEOTEXTILE" OR "NURSERY SHADE".
3. LUMBER SIZES ARE NOMINAL INCHES.
4. AS SHOWN CLOTH TO BE BURIED AT BASE TO INDICATED DIMENSION.
5. 1 x 2 CLOTH BARRIER CAPS TO BE NAILED @ 12" OC.
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9. ALL SEAMS TO BE CAPPED WITH MINIMUM 1 x 2.
10. ALL JOINTS TO BE SECURELY FASTENED BY MECHANICAL MEANS.



STANDARD DETAIL FOR
DUST CONTROL FENCE

SCALE: NTS

REQUIREMENTS FOR WARNING SIGN



1. **General Requirements:** Furnish all labor, materials and equipment necessary to construct and install warning signs as specified hereinafter.
2. **Materials**
 - a. **Backing:** Backing shall be 6061-T6 aluminum 0.032-inch minimum thickness.
 - b. **Paint:** Paint shall be satin finish, exterior grade or factory baked enamel or a combination thereof.
3. **Colors:** Signs shall have white background. Remaining items shall be similar to Rust-Oleum Federal Safety Red.
4. **Requirements for Warning Sign:** Message configuration and dimensions shall be in accordance with the attached illustration.
5. **Installation**
 - a. Signs shall be located at 50-foot intervals around roped off work area or at all entrances in the case of interior work.
 - b. Signs shall be attached to the rope barrier, rope barrier supports, individual sign supports or buildings. Do not use nails to attach signs to building(s).
6. **Clean-up:** Remove all signs upon completion of project. Repair any damages caused by sign mounting and removal.

DEPARTMENT OF HEALTH ILLEGAL DUMPING NOTICE

The law requires you to dispose solid waste only at recycling or disposal facilities permitted by the Department of Health.

“Solid waste” includes municipal refuse, construction and demolition waste, household waste, tires, car batteries, derelict vehicles, green wastes, furniture, and appliances.

Illegal dumping of solid waste or allowing illegal disposal of solid waste on your property even if contractual or other arrangements are made could subject you to fines from \$10,000 to \$25,000 per occurrence and could lead to felony prosecution in accordance with Chapter 342H, HRS.

**Contact the Department of Health,
Solid Waste Section at (808) 586-4226
to report illegal dumping activities
or if you have further questions.**

END OF SECTION

SECTION 01567 – ENVIRONMENTAL PROTECTION

PART 1 – GENERAL

1.01 SUMMARY

- A. Section includes:
 - 1. Prevention of environmental pollution resulting from construction operations under this contract. The requirements of this Section take precedence over conflicting or contradictory provisions of other Sections.
 - 2. Obtaining all permits required by the State Department of Health.
 - 3. Providing all air and water quality testing and monitoring work required by the permits during construction.
 - 4. Providing the facilities, equipment, and structural controls for minimizing adverse impacts upon the environment during the construction period.
 - 5. Providing all provisions as required under Hawaii Administrative Rules, Title 20, Chapter 3.
- B. Related Sections include the following:
 - 1. Section 02370 - Sediment and Erosion Control.
 - 2. Section 13290 – Contaminated Media and Hazardous Materials.

1.02 DEFINITIONS

- A. For the purpose of this specification, Environmental Pollution is defined as the presence of chemical, physical, or biological elements or agents which:
 - 1. Adversely affect human/animal health or welfare.
 - 2. Unfavorably alter ecological balances important to human/animal life.
 - 3. Affect other species of importance to man.
 - 4. Degrade the utility of the environment for its normal daily function, for aesthetic, and for recreational purposes.
- B. The control of environmental pollution requires consideration of air, water and land, and involves noise control, solid waste management, and management of other pollutants.

1.03 PERFORMANCE AND COORDINATION

- A. Comply with all applicable Federal and State laws, including the latest Hawaii Public Health regulations, local laws and regulations concerning pollution control and abatement.
- B. The Contractor shall become familiar with the latest requirements of the National Pollutant Discharge Elimination System (NPDES) Permit and all other necessary permits to discharge water to State receiving waters, into storm drainage system or into the sanitary sewer system prior to bidding on this project. The Contractor will apply for appropriate Federal, State, and County permits as required.

- C. Notification: The Contracting Officer will notify the Contractor in writing of any non-compliance with the foregoing provisions and the action to be taken. Such notice, when delivered to the Contractor or his authorized representative at the site of the work, shall be deemed sufficient for the purpose of notification. After receipt of such notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be made the subject of a claim for extension of time or for excess costs or damages by the Contractor unless it was later determined that the Contractor was in compliance.
- D. Sub-Contractor: Compliance with the provisions of this Section by subcontractors will be the sole responsibility of the Contractor.

1.04 APPLICABLE REGULATIONS

- A. In order to provide for abatement and control of environmental pollution arising from the construction activities of the Contractor and his subcontractors in the performance of this contract, the work performed shall comply with the intent of the applicable Federal, State and local laws and regulations concerning environmental pollution control and abatement, including, but not limited to, the following regulations:
 1. State of Hawaii, Department of Health, Administrative Rules, Chapter 55, WATER POLLUTION CONTROL; Chapter 54, WATER QUALITY STANDARDS.
 2. State of Hawaii, Department of Health, Administrative Rules, Chapter 59, AMBIENT AIR QUALITY; Chapter 60.1, AIR POLLUTION CONTROL LAW.
 3. State of Hawaii, Department of Health, Administrative Rules, Chapter 42, VEHICULAR NOISE CONTROL; Chapter 46, COMMUNITY NOISE CONTROLS.
 4. Maui County Code 20.08 - Soil Erosion and Sediment Control.
 5. Other regulations as noted on the drawings.

1.05 SUBMITTALS

- A. Submit in accordance with Section 01300 Submittal Procedures.
- B. Manufacturer's product literature: Submit manufacturer's product literature including description of material, physical properties and Safety Data Sheets.
- C. Test Reports: Submit test reports excavation spoils and dewatered materials.

PART 2 – PRODUCTS

2.01 LAND RESOURCES PROTECTION

- A. General: Unless otherwise indicated on the drawings, existing land resources within the property lines and outside the limits of permanent work performed under this contract shall be preserved in their present condition or be restored to a condition after completion of construction that will appear to be natural and not detract from the appearance of the project. Insofar as possible, confine construction activities to areas defined by the plans or specifications.

- B. Restoration of Damage: Restore any trees or other landscape feature scarred or damaged by the Contractor's equipment or operations as nearly as possible to its original condition at the Contractor's expense. The Contracting Officer will decide what method of restoration shall be used and whether damaged trees or other landscape feature shall be treated and healed or removed from the site and replaced with new.
- C. Location of Storage and Construction Facilities: The Contractor's storage and other temporary construction buildings required temporarily in the performance of the work shall be located on the State's property. The location shall be upon cleared portions of the job site or areas to be cleared, as indicated on the plans and approved by the Contracting Officer.
- D. Post-Construction Clean-Up: Obliterate all signs of temporary construction facilities such as work areas, structures, foundations of temporary structures, stockpiles of excess or waste materials, or any other vestiges of construction as directed by the Contracting Officer. No separate payment will be made for post-construction cleanup or obliteration and all cost thereof shall be considered a portion of the Contract Price, except as otherwise provided for in the Contract Documents. Upon completion of the project, existing drain inlets, catch basins, and drainage ways adjacent to the project shall be inspected. Any accumulated sediment and debris found in the drain inlet, catch basin, or drainage way shall be removed and disposed of properly. Flushing into the drainage system is prohibited.

2.02 HISTORICAL AND ARCHAEOLOGICAL FINDS

- A. All items having any apparent historical or archeological interest discovered in the course of construction activities shall be carefully preserved. Leave the archeological find undisturbed and immediately report the find to the Contracting Officer and the State Historic Preservation Officers from the State Department of Land and Natural Resources at phone (808) 692-8015 to assess the significance of the find and recommend an appropriate mitigation measure, if necessary.

2.03 BURNING

- A. No materials may be burned within the contract area at any time within the contract period.

2.04 WATER POLLUTION

- A. General
 1. The Contractor shall not deposit at the site or in its vicinity, solid waste or discharge liquid waste, such as fuels, lubricants, bituminous waste, untreated sewage and other pollutants, which may contaminate any surface water or ground water.
 2. Care shall be taken to ensure that no petroleum products, bituminous materials, or other hazardous substances, including debris, are allowed to fall, flow, leach, or otherwise enter any surface or ground water.
 3. Contractor shall provide any necessary temporary drainage, dikes, and similar facilities to prevent erosion damage to the site. Run-off shall be controlled to prevent damage to surrounding area.
- B. Site Specific Construction BMP Plan: Develop a site-specific construction BMP Plan as delineated in Section 02370 Sediment and Erosion Control.

- C. Water Pollution Conference: Schedule a water pollution and erosion control conference with the Contracting Officer at least 14 calendar days before the start of construction work to discuss the sequence of work, plans and proposals for water pollution and erosion control.
- D. Construction Requirements:
1. Coordinate any temporary control provisions with the permanent control features throughout the construction and post-construction period.
 2. Apply accepted erosion control measures to all exposed erodible or stockpiled material within 14 calendar days of exposure. If after 14 calendar days, the erosion control measures have not been applied, apply an accepted erosion control measure on the fifteenth day at no cost to the State. Failure to apply erosion control measures will result in the increase in the amount of retainage and/or the withholding of the monthly progress payment.
 3. Provide for controlled discharge of waters impounded, directed, or controlled by project activities or erosion control measures.
 4. Properly maintain all erosion control features. Inspect, remove debris collected and make necessary repairs to all erosion control measures at the following intervals:
 - a. Weekly, or as needed, during dry periods,
 - b. Within 24 hours of any rainfall of 0.25 inch or greater which occurs in a 24-hour period,
 - c. Daily during periods of prolonged rainfall,
 - d. When existing erosion control measures are damaged or not operating properly as specified by the Contracting Officer,
 - e. Temporary removal of construction BMPs that may affect drainage or cause a potential flooding hazard in the event of a weather advisory warning.
 5. When there are conflicts between these requirements and laws, rules, or regulations of other Federal or State local agencies, the more restrictive laws, rules, or regulations shall apply.
 6. Failure to conform with the above requirements and regulations of the Federal or State local agencies will be cause for temporary or permanent suspension of operations. If operations are suspended due to the Contractor's failure to conform, the Contractor shall maintain the project during the period of suspension at no cost to the State.
- E. 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 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 damages shall be made for the time lost due to such stop action.

2.05 SEDIMENT CONTROL

- A. The Contractor shall install and maintain temporary sediment control devices in accordance with Maui County Code 20.08 Soil Erosion and Sediment Control and Section 02370 Sediment and Erosion Control.
- B. The Contractor shall inspect all BMPs, and shall make any necessary repairs and adjustments to all BMPs continuously for the duration of the project at the following intervals:
 - 1. Preconstruction: prior to any ground disturbing activities.
 - 2. Weekly for the duration of construction.
 - 3. Within 24 hours of any rainfall event of 0.25-inch or greater occurring in a 24-hour period. The Contractor shall notify the Contracting Officer when such rainfall events occur.
 - 4. Daily during periods of prolonged rainfall.
 - 5. When existing BMPs are damaged, not operating properly, or as specified by the Contracting Officer.
 - 6. Temporary removal of construction BMPs that may affect drainage or cause a potential flooding hazard in the event of a weather advisory warning.
 - 7. Conclusion: after all disturbed areas have been stabilized and temporary BMP's have been removed.

2.06 DUST CONTROL

- A. For the duration of the contract, the Contractor, at his own expense, shall keep the project area and the surrounding areas free from dust that would cause a hazard or nuisance to the work or the operations of other contractors or to persons or property. The work shall be in conformance with the Air Pollution Control Standards and the Regulations of the State Department of Health. Contractor shall construct construction/dust fence as designated on plan and submit fence assembly and materials used for fence. Approved temporary methods of stabilization consisting of sprinkling or similar methods may be permitted to control dust. If approved, sprinkling must be repeated at such intervals as to keep all parts of the disturbed area at least damp at all times, and the Contractor must have sufficient competent equipment on the job to accomplish this if sprinkling is used. Chemicals or oil treating shall not be used.
- B. Control dust as the work proceeds and whenever a dust nuisance or hazard occurs. Controls shall be maintained from the start of construction until completion of the project or as directed by the Contracting Officer. No separate or direct payment will be made for dust control and the cost thereof shall be considered incidental to and included in the Contract price.
- C. The Contractor shall construct dust screens around all non-granular stockpile materials and spoil materials.

2.07 NOISE CONTROL

- A. Noise shall be kept within acceptable levels at all times in conformance with the State Department of Health, Administrative Rules, Title 11, Chapter 46 - Community Noise

Control. The Contractor shall obtain and pay for the Community Noise Permit from the State Department of Health when construction equipment or other devices emit noise at levels exceeding the allowable limits. Construction equipment and on-site vehicles or devices requiring an exhaust of gas or air shall have mufflers. The Contractor shall comply with conditional use of the permit as specified in the rules and the conditions issued with the permit. Should there be a baseyard or stockpile area located adjacent to residences, mitigative measures, such as barriers or berms, shall be developed in the event that noise complaints are received.

- B. The Contractor shall implement the best available control technology to ensure that the maximum permissible sound levels of 55 dBA (Class A Zoning District - Residential) are not exceeded as measured from the property line or 50 feet from the generator, whichever is closer.
- C. Where required, the Contractor shall obtain and maintain a Community Noise Permit. The Contractor shall comply with the conditional use of the permit as specified in the rules and the conditions issued with the permit.
- D. The Contractor is forewarned that failure to employ best management noise limiting practices could lead to complaints from the public and/or penalties by the State of Hawaii Department of Health as provided in section 342F-11, HRS, and section 11-46-18, HAR Title 11 Chapter 46. The Contractor is responsible for all monetary fines or corrective action required as a result of complaints from the public and/or penalties from the County of Maui, State or Federal agencies at no additional cost to the State.
- E. Blasting and use of explosives will not be permitted.
- F. Construction activities shall not emit noise in excess of the maximum permissible sound levels. No work shall be conducted on weekends and/or holidays unless approved by the Contracting Officer.
- G. Compliance with the provisions of this Section by the subcontractors will be the responsibility of the Contractor.
- H. 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 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 damages shall be made for the time lost due to such stop action.
- I. The Contractor is forewarned that failure to employ best management noise limiting practices could lead to complaints from the public. The State of Hawaii Department of Health is empowered to reduce the allowable hours of work or to revoke the noise variance in its entirety on the basis of public complaints, even if the Contractor is monitored to be within the preceding numerical noise limits. The Contractor shall not be given a time extension or compensated for additional costs or damages due to a reduction of work hours or revocation of the variance.

2.08 EMISSION CONTROL

- A. The Contractor shall not be allowed to operate equipment and vehicles that show excessive emissions of exhaust gases until corrective repairs or adjustments are made, as determined by the Contracting Officer.

2.09 MAINTENANCE

- A. During the life of this Contract, maintain all environmental protection and pollution controls specified herein as long as the operations creating the particular pollutant are being carried out or until the material concerned has become stabilized to the extent that pollution is no longer being created.

2.10 WASTEWATER DISCHARGES/SPILLS

- A. The Contractor shall be liable for any treatment of discharges that are required before disposal and for any fines, clean-up costs and damages, which may occur through the violation of any federal, state and county law or regulation which may be applicable.
- B. The Contractor shall be liable for all clean-up costs, fines and damages resulting from wastewater spill related to any construction activities. The Contractor shall not store chemicals, materials or equipment at the work site unless specifically authorized by the Contracting Officer.
- C. The Contractor shall anticipate and capture wastewater spills in containers for planned disposal at existing facilities. The disposal of captured wastewater will require approval from the Contracting Officer and DOH. The wastewater spill containment and mitigation plan shall include, at a minimum, spill containment, disposal, clean up and treatment methods for the captured wastewater. The Contractor shall be liable for any costs associated with the transport and treatment of wastewater discharges that may be required before ultimate disposal.

2.11 POLLUTANTS AND HAZARDOUS MATERIALS

- A. During construction, excavation spoils and dewatered materials shall be tested to determine if pollutants, as defined by the DOH, are present in the sediment, excavation spoils and dewatered materials. Also see testing and disposal requirements in Section 13290 Contaminated Media and Hazardous Materials.
- B. Pollutants, if encountered in the sediment, excavation spoils and dewatered materials, shall be removed from the polluted materials in accordance with applicable U.S. Environmental Protection Agency (EPA) rules and regulations, EPA's Resource Conservation and Recovery Act (RCRA), U.S. Department of Transportation regulations and State of Hawaii Department of Health rules, regulations and policies.
- C. If the pollutants are defined as hazardous waste under RCRA, the Contractor shall clean-up, handle, store, treat, remove and dispose the polluted materials as hazardous waste under RCRA.
- D. If the pollutants are not hazardous, the requirements of RCRA shall not apply. However, the Contractor shall remove the pollutants as defined above by DOH from the polluted excavation spoils and dewatered materials by treatment, and then dispose the treated materials and pollutants, if necessary, in accordance with DOH policies. Excavations shall not be backfilled with the original untreated excavation material if pollutants are present in this material, unless it can be demonstrated to the DOH that backfilling with clean soils will become contaminated or that backfilling with the treated originally excavated material will become re-contaminated due to the existing polluted conditions at the site. In excavations where contamination of the backfill would occur, the backfill to the top of the groundwater table may consist of the original excavated contaminated material covered with uncontaminated material placed on top of the contaminated

backfill and a cap of asphalt or concrete as provided to ensure no contaminated materials exist between the groundwater table and the surface.

- E. The Contractor shall submit to the Contracting Officer copies of all test results. The Contractor shall furnish to the State affidavits certifying that polluted excavation spoils and dewatered materials have been treated, all pollutants as defined by the DOH have been removed from the materials, and only treated water meeting the DOH basic water quality criteria has been discharged in the existing drainage system and treated soils backfilled into the excavation.
- F. The State will monitor the Contractor's work, if pollutants are encountered, to ensure compliance with the above requirements.

2.12 DISPOSAL

- A. Construction waste, such as crates, boxes, building materials, pipes and other rubbish shall be disposed of at the County Disposal areas. Large size objects shall be reduced to a size acceptable by the County Specifications. Other areas or methods proposed by the Contractor will be approved only if the Contracting Officer determines that their effect on the environment is equal to or less than those described herein.
- B. Removal of wastes shall be a continuous on-going operation. Wastes and debris shall not be allowed to accumulate in large open piles.
- C. Wind-blown wastes and debris shall be collected by the Contractor and disposed as described above.
- D. Upon completion of the project, existing drain inlets, catch basins, and drainage ways adjacent to the project shall be inspected. Any accumulated sediment and debris found in the drain inlet, catch basin, or drainage way shall be removed and disposed of properly. Flushing into the drainage system is prohibited.

PART 3 – EXECUTION (Not Used)

END OF SECTION

SECTION 01715 – EXISTING CONDITIONS – HAZARDOUS MATERIALS SURVEY

PART 1 - GENERAL

1.01 SUMMARY

- A. A report entitled *Limited Hazardous Materials Survey State of Hawaii Department of Transportation – Maui District Baseyard Expansion & Renovation, Part 2* located at 650 Palapala Drive, Kahului, Maui, Hawaii, dated May 10, 2022 was prepared by EnviroServices & Training Center, LLC for the design of this project.
- B. Related Sections include the following:
 - 1. Section 13282 – Lead-Containing Paint Control Measures for requirements of all work that disturbs Lead-Containing Paint (LCP).
 - 2. Section 13288 – Testing/Air Monitoring for requirements of all work that disturbs Asbestos-Containing Materials and Lead-Containing Paint.

1.02 ASBESTOS-CONTAINING MATERIALS

- A. The structure to be modified under this contract was surveyed for the presence of asbestos-containing materials (ACM). A copy of the initial survey report, as well as any subsequent supplemental survey reports, if performed, is included in the Section.
 - 1. The Contractor is responsible for conducting his/her own site investigation to verify the quantities and locations for ACM.
 - 2. The Contractor may perform further surveys at its own expense if ACM not shown in the reports is suspected in the areas in which work will be performed. If ACM is found, notify the State immediately.
 - 3. If there is ACM outside of the areas in which work will be performed, this ACM shall not be disturbed in any way.
- B. If applicable, the Contractor shall notify his employees, subcontractors and all other persons engaged in the demolition and abatement work of the presence of asbestos in accordance with the requirements of Chapter 110, Article 12-110-2 (f) (1) (B) of the Occupational Safety and Health Standards, State of Hawaii.
- C. In the event that work is required in any area on the site other than those designated in the project scope, the Contractor shall request copies of the asbestos survey reports for each such area from the State. Based on the information contained in the additional survey(s), notify all persons on the project as indicated in paragraph 1.02 B.

1.03 LEAD-CONTAINING PAINT

- A. The structure to be modified under this contract was surveyed for the presence of lead-containing paints (LCP). A copy of the initial survey report, as well as any subsequent supplemental survey reports, if performed, is included in the Section.
 - 1. The Contractor is responsible for conducting his/her own site investigation to verify the quantities and locations for LCP.

2. The Contractor may perform further surveys at its own expense if LCP not shown in the reports is suspected in the areas in which work will be performed. If LCP is found, notify the State immediately.
 3. If there is LCP outside of the areas in which work will be performed, this LCP shall not be disturbed in any way.
- B. Inform employees, Subcontractors and all other persons engaged in the project that lead-containing paint (LCP) is present in the existing building and at the job site. Follow the requirements of Title 12 (Department of Labor and Industrial Relations), Subtitle 8 (Division of Occupational Safety and Health), Chapter 148 (Lead Exposure in Construction), Hawaii Administrative Rules.
- C. Review the attached lead testing data which identifies the locations LCP was found. Lead testing was for design purposes only and the results do not satisfy any of the requirements of HIOSH Chapter 12-148

PART 2- PRODUCTS (Not Used)

PART 3 – EXECUTION

3.01 SURVEY (attached)

Limited Hazardous Materials Survey Report, State of Hawaii Department of Transportation – Maui District Baseyard Expansion & Renovation, Part 2 located at 650 Palapala Drive, Kahului, Maui, Hawaii, dated May 10, 2022, prepared by EnviroServices & Training Center, LLC.

END OF SECTION



May 10, 2022

via email: yvonne@tlcghawaii.com

The Limtiaco Consulting Group
1622 Kananui Street
Honolulu, Hawaii 96817

Attention: Ms. Yvonne Turro

Subject: Limited Hazardous Materials Survey
Department of Transportation
Maui District Baseyard Expansion & Renovation, Part 2
650 Palapala Drive, Kahului, Maui, Hawaii 96732
TMK: (2) 3-8-079:018
Project No. HWY-M-03-21, Phase 2

The following comprehensive report documents the limited hazardous materials activities performed at Department of Transportation Maui Baseyard, Kahului, Maui, Hawaii on April 26, 2022. ETC inspected the Subject Site for suspected asbestos-containing materials (ACM), lead-containing paints (LCP), and arsenic-containing materials (AsM) as specified by Ms. Yvonne Turro of the Limtiaco Consulting Group.

Laboratory analysis indicated that no asbestos-containing materials were found, however lead-based and lead-containing paints were identified. These findings are summarized below:

Lead-Based Paints

- Yellow paint on the fuel station parking bollards was lead-based.

Lead-Containing Paints

- Red paint on the fuel station tank motor and pipes was lead-containing.
- Brown paint on the fuel station concrete canopy was lead-containing.
- Off-white paint on the maintenance building interior conduit was lead-containing.
- Off-white paint on the repair shop interior conduit was lead-containing.
- Grey paint on the repair shop exterior conduit and junction box was lead-containing
- Brown paint on the repair shop exterior CMU walls was lead-containing

The findings and recommendations of ETC's limited hazardous material survey extended only to those areas that were accessible at the time of the site reconnaissance. Any areas that were inaccessible either due to physical restraints (i.e. areas within walls, behind locked doors, beneath flooring materials, hidden

materials, etc.) or occupancy are not covered under the scope of this survey and should be evaluated for hazardous materials separately prior to any disturbance.

If you have any questions or desire further information, please feel free to contact me at 808-839-7222.

Respectfully,

ENVIROSERVICES & TRAINING CENTER, LLC



Sara Marvin
Environmental Scientist

LIMITED HAZARDOUS MATERIALS SURVEY REPORT

State of Hawaii Department of Transportation
Maui District Baseyard Expansion & Renovation, Part 2
650 Palapala Drive
Kahului, Maui, Hawaii 96732

Prepared for:
The Limtiaco Consulting Group
1622 Kananui Street
Honolulu, Oahu, Hawaii 96817

Prepared by:
ENVIROSERVICES & TRAINING CENTER, LLC
505 Ward Avenue, Suite 202
Honolulu, Hawaii 96814
tel: (808) 839-7222

Project No. HWY-M-03-21, Phase 2
ETC Project No. 19-3501

May 10, 2022

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1.0 CERTIFICATIONS AND LIMITATIONS

EnviroServices & Training Center, LLC (ETC) has completed this Limited Hazardous Materials Survey (Survey) of the State of Hawaii Department of Transportation, Maui Baseyard, located at 650 Palapala Drive, Kahului, Maui, Hawaii (Subject Site). ETC's findings and recommendations contained herein are based on site observations, government regulations and laboratory data, which were gathered at the time and location of the study. Opinions stated in this report do not apply to changes that may have occurred after the services were performed.

ETC has performed specified services for this project with the degree of care, skill and diligence ordinarily exercised by professional consultants performing the same or similar services. No other warranty, guarantee, or representation, expressed or implied, is included or intended, unless otherwise specifically agreed to in writing by both ETC and ETC's Client.

This report is intended for the sole use of the Limtiaco Group (Client), exclusively for the Subject Site. Client may use and release this report, including making and retaining copies, provided such use is limited to the Subject Site and project for which this report is provided. However, the services performed may not be appropriate for satisfying the needs of other users. Release of this report to third-parties will be at the sole risk of ETC's Client and/or said user, and ETC shall not be liable for any claims or damages resulting from or connected with such release or any third party's use or reuse of this report.

Surveyed and
Prepared By:



Sara Marvin
State of Hawaii Asbestos Building Inspector # HIASB-4361
State of Hawaii Lead Based Risk Assessor # PB-0973

2.0 EXECUTIVE SUMMARY

ETC has conducted a Survey and compiled this report for the State of Hawaii Department of Transportation, Maui Baseyard located at 650 Palapala Drive, Kahului, Hawaii, the Subject Site. The scope of services was limited to the fuel station, maintenance building, repair shop, and truck shed as specified by Ms. Yvonne Turro of the Limtiaco Consulting Group. The following summarizes the results of ETC's survey on April 26, 2022

2.1 Summary of Asbestos Containing Building Materials Survey

None (0) of the suspected asbestos-containing materials were found to contain any detectable amounts of asbestos.

2.2 Summary of Lead Paint Survey

One (1) of the sampled paints was found to contain lead in excess of the Environmental Protection Agency (EPA)/United States Department of Housing and Urban Development (HUD) guideline of 5,000 mg/kg lead by weight, defining Lead-Based Paint (LBP). The following table summarizes these findings.

Lead-Based Paints

Location	Color	Substrate	Description	Estimated Quantity
Fuel station – parking bollards	Yellow	Concrete	Fair	100 l.f

Six (6) of the sampled paints were found to contain lead above the laboratory detection limit of 40 mg/kg lead by weight, but below the EPA/HUD guideline for lead-based paint, classifying it as Lead-Containing Paint (LCP). The following table summarizes these findings.

Lead-Containing Paints

Location	Color	Substrate	Description	Estimated Quantity
Fuel station – fuel motor & piping	Red	Metal	Poor	100 l.f
Fuel station – canopy pillars	Brown	Concrete	Intact	200 ft ²
Maintenance building – interior conduit	Off-white	Metal	Intact	50 l.f
Repair shop – interior conduit	Off-white	Metal	Fair	100 l.f
Repair shop – exterior conduit & junction box	Grey	Metal	Fair	50 l.f
Repair shop - exterior walls	Brown	CMU	Intact	50 ft ²

The remaining eight (8) sampled paints did not contain any detectable amounts of lead, classifying them as non-lead containing.

2.3 Summary of Arsenic Survey

ETC personnel surveyed for materials suspected of being treated with arsenic, from the Subject Site. No suspected AsCM were identified.

3.0 INTRODUCTION/PURPOSE

The purpose of this Survey was to inspect the Subject Site for the presence of hazardous materials potentially disturbed by renovations in the fuel station, maintenance shop, repair shop, and truck shed of the Maui Baseyard. Specifically, ETC completed the following tasks:

- Mobilized a State of Hawaii Department of Health (DOH)/ Environmental Protection Agency (EPA) certified asbestos building inspector and lead risk assessor to the Subject Site;
- Collected forty-two (42) samples of fourteen (14) suspected asbestos-containing materials (ACM) from the Subject Site and recorded the location of each material;
- Submitted the 42 samples of suspected ACM to Hawaii Analytical Laboratory (HAL) for asbestos analysis via Polarized Light Microscopy (PLM) in accordance with the National Institute for Occupational Safety and Health (NIOSH) Method 600/R -93/116;
- Collected fifteen (15) paint chip samples from the Subject Site;
- Submitted the 15 paint chip samples HAL for analysis by flame atomic absorption spectroscopy (FAAS) via EPA SW-846 Method 7420 for total lead content;
- Collected no (0) suspected arsenic-containing materials, and
- Prepared this report documenting the field activities and the results of the investigation including analytical results, conclusions, and recommendations.

4.0 METHODOLOGY

4.1 Asbestos

ETC personnel collected a total of forty-two (42) samples of fourteen (14) suspected ACM for asbestos analysis. Samples were collected in accordance with EPA guidelines and recommendations.

The suspected ACM was wetted before sample collection. A small piece was then carefully cut out and placed into a labeled, re-sealable plastic bag. The sampling equipment was cleaned between each sample collection to avoid cross-contamination between samples. Sample locations were randomly selected in accordance with EPA protocols and recommendations.

Samples were logged and recorded following strict chain-of-custody procedure and submitted to HAL located in Honolulu, Hawaii for analysis by PLM in accordance with EPA Method 600/R-93/116. HAL is accredited for bulk asbestos analysis through successful participation in the National Voluntary Lab Accreditation Program (NVLAP).

4.2 Lead Paint

ETC personnel collected and had analyzed fifteen (15) paint chip sample from the Subject Site in accordance with the EPA guidelines and recommendations.

The suspected lead-containing paints were wetted with amended water before sample collection. Paint was carefully scraped and placed into a labeled re-sealable plastic bag. The sampling equipment was cleaned between each sample collection to avoid cross-contamination between samples.

Samples were logged and recorded following strict chain-of-custody procedure and submitted to HAL located in Honolulu, Hawaii for analysis by FAAS, in accordance with EPA Method 7420. HAL is an Environmental Lead Laboratory Accreditation Program (ELLAP)-accredited laboratory.

4.3 Arsenic

ETC personnel surveyed for materials suspected of being treated with arsenic, from the Subject Site. No suspected AsCM were identified.

5.0 RESULTS

5.1 Asbestos

A total of forty-two (42) suspect asbestos samples were collected from fourteen (14) suspected materials and submitted for analysis via PLM. None (0) of the sampled materials were found to contain levels of asbestos above the regulatory limit of 1%.

In accordance with federal and state regulations, and industry standard practice, ETC determined homogeneous areas of each suspect material and collected multiple representative samples of the material from each homogeneous area by building and floor. Typically, all samples for a suspect material will have similar laboratory results. When the results differ, a single result above the regulatory limit is sufficient to determine that the material within the homogeneous area is ACM and the entirety of the homogeneous area should be treated as ACM. Thus, ETC may request that the laboratory stops analyzing when the first sample in the set is determined to have an asbestos content above one percent.

In addition, one (1) material was found to contain fibrous glass and Wollastonite. It is ETC's recommendation to handle materials containing such fibers with appropriate protective equipment.

A detailed list of sampled asbestos and results can be found in Table 1 included in Appendix I. Asbestos laboratory analytical results are included in Appendix II.

5.2 Lead Paint

One (1) of the paint samples were determined to contain lead in excess of the Environmental Protection Agency (EPA)/United States Department of Housing and Urban Development (HUD) guideline of 5,000 mg/kg lead by weight defining Lead-Based Paint (LBP).

Six (6) of the sampled paints were found to contain detectable levels of lead less than the EPA/HUD guideline but greater than or equal to the reporting limit for the laboratory of 40 mg/kg lead by weight, classifying them as Lead-Containing Paint (LCP).

The eight (8) remaining sampled paint was not found to contain any detectable amounts of lead, classifying them as non-lead containing.

A detailed list of sampled paints and results can be found in Table 2 included in Appendix I. Lead laboratory analytical results are included in Appendix II. A Homogenous Area Map is included in Appendix III. Photographic Documentation is included in Appendix IV.

5.3 Arsenic

ETC personnel surveyed for materials suspected of being treated with arsenic, from the Subject Site. No suspected AsCM were identified.

6.0 DISCUSSION AND RECOMMENDATIONS

The findings and recommendations of ETC's limited hazardous material survey extended only to those areas that were accessible at the time of the site reconnaissance. ETC collected samples from inconspicuous areas when possible. Any areas that were inaccessible either due to physical restraints (i.e. areas within walls, behind locked doors, beneath flooring materials, hidden materials, etc.) or occupancy are not covered under the scope of this survey and should be evaluated for hazardous materials separately prior to any disturbance.

Based on ETC's visual inspection of the Subject Site and laboratory data, ETC recommends the following:

- Any materials at the Subject Site that are suspected to contain a hazardous contaminant but was not tested as part of this survey should be tested prior to disturbance.
- Manage and/or remove and dispose of hazardous and regulated materials in accordance with applicable federal, state, and local regulations, prior to renovation and/or demolition activities that may disturb these materials.
- Handle materials containing Wollastonite and/or glass fibers with appropriate protective equipment to prevent inhalation or ingestion of fibers and contact with skin and mucous membranes.
- Remove and dispose of all loose and flaking (poor condition) LCP that may be disturbed during renovation/demolition activities in accordance with applicable federal, state, and local regulations. Note that conditions of paint may have changed since the time of this survey.
- All waste and debris generated from the removal of LCP must either be recycled in accordance with applicable regulatory requirements, where available (e.g. metal components), or undergo Toxicity Characteristic Leaching Procedure (TCLP)-Lead analysis prior to disposal.
- Retain the services of a qualified consultant to monitor and inspect the removal activities to ensure compliance with specifications and applicable EPA, OSHA, and HIOSH regulations pertaining to the handling of asbestos-containing materials and lead-containing paint.
- Conduct air monitoring for asbestos fibers and lead dust by qualified personnel during abatement and general renovation/demolition activities of areas that were determined to contain these contaminants.
- Handle materials containing <1% asbestos with the same care and appropriate protective equipment as regulated asbestos containing materials to prevent inhalation or ingestion of fibers and contact with skin and mucous membranes.

Appendix **I**

TABLES OF RESULTS

Table 1
Maui Baseyard
Fuel Station
Asbestos Survey Results

<i>Sample ID</i>	<i>Homogeneous Area</i>	<i>Material</i>	<i>Condition</i>	<i>Category</i>	<i>Friability</i>	<i>Asbestos Content</i>	<i>Estimated Quantity</i>
1901-F-A01	Ground	Concrete	Good	Misc	N/A	ND	500 ft ²
1901-F-A02						ND	
1901-F-A03						ND	
1901-F-A04	Ground	Asphalt	Good	Misc	N/A	ND	100 ft ²
1901-F-A05						ND	
1901-F-A06						ND	
1901-F-A07	Platform/ ground joint	Grey caulking	Good	Misc	N/A	ND	100 linear feet
1901-F-A08						ND	
1901-F-A09						ND	
1901-F-A10	Concrete joint	Black caulking	Good	Misc	N/A	ND	50 linear feet
1901-F-A11						ND	
1901-F-A12						ND	
1901-F-A13	Pipe joint on tanks	Black gasket	Good	Misc	N/A	ND	2 ft ²
1901-F-A14						ND	
1901-F-A15						ND	
1901-F-A16	Diesel fuel tank	Textured coating	Good	Misc	N/A	ND	500 ft ²
1901-F-A17						ND	
1901-F-A18						ND	

ND = None Detected

*Wollastonite/Fibrous Glass

Table 1
Maui Baseyard
Maintenance Building
Asbestos Survey Results

<i>Sample ID</i>	<i>Homogeneous Area</i>	<i>Material</i>	<i>Condition</i>	<i>Category</i>	<i>Friability</i>	<i>Asbestos Content</i>	<i>Estimated Quantity</i>
1901-M-A01	Maintenance locker room ceiling/storage walls	Drywall with joint compound	Damaged	Misc	N/A	ND*	1000 ft ²
1901-M-A02						ND*	
1901-M-A03						ND*	
1901-M-A04	Maintenance locker room wall	CMU with grout	Damaged	Misc	N/A	ND	25 ft ²
1901-M-A05						ND	
1901-M-A06						ND	
1901-M-A07	Maintenance locker room electrical panel	White caulking	Good	Misc	N/A	ND	15 linear feet
1901-M-A08						ND	
1901-M-A09						ND	
1901-M-A10	Maintenance locker room floor	Concrete	Good	Misc	N/A	ND	25 ft ²
1901-M-A11						ND	
1901-M-A12						ND	

ND = None Detected
*Wollastonite/Fibrous Glass

Table 1
Maui Baseyard
Repair Shop
Asbestos Survey Results

<i>Sample ID</i>	<i>Homogeneous Area</i>	<i>Material</i>	<i>Condition</i>	<i>Category</i>	<i>Friability</i>	<i>Asbestos Content</i>	<i>Estimated Quantity</i>
1901-R-A01	Repair shop interior walls	CMU with grout	Good	Misc	N/A	ND	25 ft ²
1901-R-A02						ND	
1901-R-A03						ND	
1901-R-A04	Repair shop interior floor and panel base	Concrete	Good	Misc	N/A	ND	25 ft ²
1901-R-A05						ND	
1901-R-A06						ND	
1901-R-A07	Repair shop exterior walls	CMU	Good	Misc	N/A	ND	25 ft ²
1901-R-A08						ND	
1901-R-A09						ND	

ND = None Detected
 *Wollastonite/Fibrous Glass

Table 2
Maui Baseyard
Fuel Station
Lead Survey Results

Sample ID	Int/Ext	Homogeneous Areas	Color	Substrate	Condition	Laboratory Reporting Limit (mg/kg)	Results (mg/kg)
1901-F-L01	Ext	Parking lines	White/yellow composite	Asphalt/concrete	Fair	40	BRL
1901-F-L02	Ext	Parking bollards	Yellow	Concrete	Fair	110	75000
1901-F-L03	Ext	Fuel tank pipes	White	metal	Fair	45	BRL
1901-F-L04	Ext	Fuel tanks	White	Concrete	Fair	40	BRL
<i>1901-F-L05</i>	<i>Ext</i>	<i>Fuel tank motor & pipes</i>	<i>Red</i>	<i>Metal</i>	<i>Fair</i>	<i>81</i>	<i>180*</i>
1901-F-L06	Ext	Pipes	Green	Metal	Fair	50	BRL
<i>1901-F-L07</i>	<i>Ext</i>	<i>Canopy pillars</i>	<i>Brown</i>	<i>Concrete</i>	<i>Fair</i>	<i>40</i>	<i>400*</i>

BRL = Below Reporting Limit
 *Lead-Containing Paint
Bold - Lead-Based Paint

Table 2
Maui Baseyard
Maintenance Building
Lead Survey Results

Sample ID	Int/Ext	Homogeneous Areas	Color	Substrate	Condition	Laboratory Reporting Limit (mg/kg)	Results (mg/kg)
1901-M-L01	Int	Locker room ceiling/walls	Off-white	Drywall	Fair	40	BRL
1901-M-L02	Int	Locker room walls	Off-white	CMU	Fair	41	BRL
<i>1901-M-L03</i>	<i>Int</i>	<i>Conduit</i>	<i>Off-white</i>	<i>Metal</i>	<i>Poor</i>	<i>42</i>	<i>95*</i>

BRL = Below Reporting Limit

**Lead-Containing Paint*

Bold = Lead-Based

Table 2
Maui Baseyard
Repair Shop
Lead Survey Results

Sample ID	Int/Ext	Homogeneous Areas	Color	Substrate	Condition	Laboratory Reporting Limit (mg/kg)	Results (mg/kg)
1901-R-L01	Int	Wall	Off-white	Concrete/C MU	Fair	40	BRL
<i>1901-R-L02</i>	<i>Int</i>	<i>Conduit</i>	<i>Off-white</i>	<i>Metal</i>	<i>Fair</i>	43	180*
<i>1901-R-L03</i>	<i>Ext</i>	<i>Junction/conduit</i>	<i>Grey</i>	<i>Metal</i>	<i>Intact</i>	86	3800*
<i>1901-R-L04</i>	<i>Ext</i>	<i>Wall</i>	<i>Brown</i>	<i>CMU</i>	<i>Fair</i>	64	84*

BRL = Below Reporting Limit

*Lead-Containing Paint

Bold = Lead-Based

Table 2
Maui Baseyard
Truck Shed
Lead Survey Results

Sample ID	Int/Ext	Homogeneous Areas	Color	Substrate	Condition	Laboratory Reporting Limit (mg/kg)	Results (mg/kg)
1901-S-L01	Int	Wall/conduit	Grey	Metal	Fair	40	BRL

BRL = Below Reporting Limit

**Lead-Containing Paint*

Bold = Lead-Based

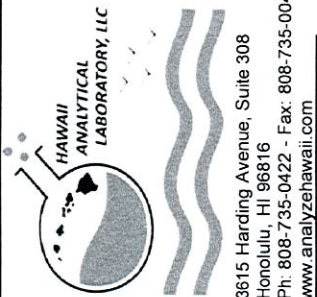
Appendix **II**

LABORATORY ANALYTICAL RESULTS AND CHAIN-OF-CUSTODY FORMS

New Client?

Report To* : Antone Gabriel
 Company : ENVIROSERVICES & TRAINING CENTER, LLC
 Address* : 505 Ward Ave. Suite #202
 Honolulu, HI 96814
 Phone / Cell No.* : (808) 839-7222
 Report results to : Antone Gabriel
 via email or fax : agabriel@gotoetc.com, smarvin@gotoetc.com
 bcarroll@gotoetc.com, jcorpus@gotoetc.com

Invoice To* : Antone Gabriel
 Company : ENVIROSERVICES & TRAINING CENTER, LLC
 Address* : 505 Ward Ave. Suite #202
 Honolulu, HI 96814
 Phone / Cell No.* : (808) 839-7222
 Purchase Order No. :
 Email Invoice To : agabriel@gotoetc.com



Need Results By*:

- 5 Working Days (WD)
- 4 WD
- 3 WD
- 2 WD
- 24 hours
- 6 hours or less
- 4 hours or less
- 1-2 hours

Site/Project Name: **DOT Maui Highways Baseyard** Client Project No.: **19-3501** Sampled By: **S. Marvin**

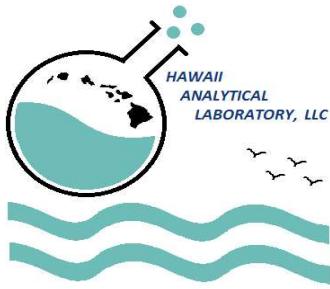
Comments / Special Instructions: verbal results needed? **LAB USE ONLY**
 Lab Report No.: **202204193**

Sample Identification / Description* (Maximum of 30 Characters)	Date Sampled* (mm/dd/yy)	Collection Medium	Sample Area / Air Volume	Analysis Requested*	Method Reference	LAB USE ONLY Lab Report No.:
1901-F-L01	4/26/2022	Paint Chip		Lead		202232827
1901-F-L02	4/26/2022	Paint Chip		Lead		202232828
1901-F-L03	4/26/2022	Paint Chip		Lead		202232829
1901-F-L04	4/26/2022	Paint Chip		Lead		202232830
1901-F-L05	4/26/2022	Paint Chip		Lead		202232831
1901-F-L06	4/26/2022	Paint Chip		Lead		202232832
1901-F-L07	4/26/2022	Paint Chip		Lead		202232833
1901-M-L01	4/26/2022	Paint Chip		Lead		202232834
1901-M-L02	4/26/2022	Paint Chip		Lead		202232835
1901-M-L03	4/26/2022	Paint Chip		Lead		202232836
1901-R-L01	4/26/2022	Paint Chip		Lead		202232837
1901-R-L02	4/26/2022	Paint Chip		Lead		202232838

Relinquished By (Print and Sign) **Sara Marvin** Date/Time **4/28/2022**
 Received By (Print and Sign) **Anne Antin** Date/Time **04-28-22 A 11:24 RCVD**
Anne Antin

Sample description can be paint chips, concrete, specific sample collection location, etc...
 If matrix is 'soil', please specify if it is a FOREIGN SOIL SAMPLE (outside Hawaii) in the comment section.
 All samples submitted are subject to Hawaii Analytical Laboratory terms and conditions.
 *Required fields, failure to complete these fields may result in a delay in your samples being processed.

via FedEx via USPS via



Hawaii Analytical Laboratory ANALYTICAL REPORT

Thursday, May 5, 2022

EnviroServices & Training Center, LLC
505 Ward Avenue, Suite 202
Honolulu HI 96814

Phone Number: (808)839-7222
Facsimile: (808) 839-4455
Email: -

Lab Job No: 202204194
Date Submitted: 4/26/2022
Your Project: 19-3501 DOT Maui Highways Baseyard, 4/26/2022

Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v Matrix	Date Analyzed
202232842	1901-F-A01		NONE DETECTED		None detected	Calcite + quartz	5/2/2022
	<u>Layer</u> <u>Gray cementitious material</u>						
	Comments						
202232843	1901-F-A02		NONE DETECTED		None detected	Calcite + quartz	5/2/2022
	<u>Layer</u> <u>Gray cementitious material</u>						
	Comments						
202232844	1901-F-A03		NONE DETECTED		None detected	Calcite + quartz	5/2/2022
	<u>Layer</u> <u>Gray cementitious material</u>						
	Comments						
202232845	1901-F-A04		NONE DETECTED		None detected	Tar + cementitious	5/3/2022
	<u>Layer</u> <u>Black asphalt</u>						
	Comments						
202232846	1901-F-A05		NONE DETECTED		None detected	Tar + cementitious	5/3/2022
	<u>Layer</u> <u>Black asphalt</u>						
	Comments						
202232847	1901-F-A06		NONE DETECTED		None detected	Tar + cementitious	5/3/2022
	<u>Layer</u> <u>Black asphalt</u>						
	Comments						

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EnviroServices & Training Center, LLC
 505 Ward Avenue, Suite 202
 Honolulu HI 96814

Phone Number: (808)839-7222
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 Email: -

Lab Job No: 202204194
 Date Submitted: 4/26/2022
 Your Project: 19-3501 DOT Maui Highways Baseyard, 4/26/2022

Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v Matrix	Date Analyzed
202232848	1901-F-A07		NONE DETECTED		None detected	Calcite + binder + other	5/3/2022
	<u>Layer</u> <u>Light gray caulk</u>						
	Comments						
202232849	1901-F-A08		NONE DETECTED		None detected	Calcite + binder + other	5/3/2022
	<u>Layer</u> <u>Light gray caulk</u>						
	Comments						
202232850	1901-F-A09		NONE DETECTED		None detected	Calcite + binder + other	5/3/2022
	<u>Layer</u> <u>Light gray caulk</u>						
	Comments						
202232851	1901-F-A10		NONE DETECTED		None detected	Calcite + binder + other	5/3/2022
	<u>Layer</u> <u>Black caulk</u>						
	Comments						
202232852	1901-F-A11		NONE DETECTED		None detected	Calcite + binder + other	5/3/2022
	<u>Layer</u> <u>Black caulk</u>						
	Comments						
202232853	1901-F-A12		NONE DETECTED		None detected	Calcite + binder + other	5/3/2022
	<u>Layer</u> <u>Black caulk</u>						
	Comments						
202232854	1901-F-A13		NONE DETECTED		Cellulose (undulose)	2 Binder + paint	5/3/2022
	<u>Layer</u> <u>Off-white paint / black caulk (limited)</u>						
	Comments						
202232855	1901-F-A14		NONE DETECTED		Cellulose (undulose)	2 Binder + paint	5/3/2022
	<u>Layer</u> <u>White paint / black caulk (limited)</u>						
	Comments						

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Lab Job No: 202204194
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 Your Project: 19-3501 DOT Maui Highways Baseyard, 4/26/2022

Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v Matrix	Date Analyzed
202232856	1901-F-A15		NONE DETECTED		Cellulose (undulose)	2 Binder + paint	5/3/2022
	<u>Layer</u> <u>Off-white paint / black caulk (limited)</u>						
	Comments						
202232857	1901-F-A16		NONE DETECTED		None detected	Paint + calcite + quartz	5/3/2022
	<u>Layer</u> <u>White paint / skim coat</u>						
	Comments						
202232858	1901-F-A17		NONE DETECTED		None detected	Paint + calcite + quartz	5/3/2022
	<u>Layer</u> <u>White paint / skim coat</u>						
	Comments						
202232859	1901-F-A18		NONE DETECTED		None detected	Paint + calcite + quartz	5/3/2022
	<u>Layer</u> <u>White paint / skim coat</u>						
	Comments						
202232860	1901-M-A01		NONE DETECTED		Cellulose (undulose) + fibrous glass (amorphous)	15 Gypsum	5/3/2022
	<u>Layer</u> <u>White drywall</u>						
	Comments						
202232860	1901-M-A01		NONE DETECTED		Cellulose (undulose) + wollastonite (+/- optical sign)	2 Calcite + quartz + paint	5/3/2022
	<u>Layer</u> <u>White joint compound / paint</u>						
	Comments						
202232861	1901-M-A02		NONE DETECTED		Cellulose (undulose) + fibrous glass (amorphous)	15 Gypsum	5/3/2022
	<u>Layer</u> <u>White drywall</u>						
	Comments						

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Lab Job No: 202204194
 Date Submitted: 4/26/2022
 Your Project: 19-3501 DOT Maui Highways Baseyard, 4/26/2022

Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v Matrix	Date Analyzed
202232861	1901-M-A02		NONE DETECTED		Cellulose (undulose) + wollastonite (+/- optical sign)	2 Calcite + quartz + paint	5/3/2022
	<u>Layer</u> <u>White joint compound / paint</u>						
	<u>Comments</u>						
202232862	1901-M-A03		NONE DETECTED		Cellulose (undulose) + fibrous glass (amorphous)	15 Gypsum	5/3/2022
	<u>Layer</u> <u>White drywall</u>						
	<u>Comments</u>						
202232862	1901-M-A03		NONE DETECTED		Cellulose (undulose) + wollastonite (+/- optical sign)	2 Calcite + quartz + paint	5/3/2022
	<u>Layer</u> <u>White joint compound (1) / paint</u>						
	<u>Comments</u>						
202232862	1901-M-A03		NONE DETECTED		Cellulose (undulose) + wollastonite (+/- optical sign)	2 Calcite + quartz + gypsum + paint	5/3/2022
	<u>Layer</u> <u>White joint compound (2) / light green paint</u>						
	<u>Comments</u>						
202232863	1901-M-A04		NONE DETECTED		Cellulose (undulose)	2 Calcite + quartz + paint	5/3/2022
	<u>Layer</u> <u>Light green paint / gray concrete</u>						
	<u>Comments</u>						
202232864	1901-M-A05		NONE DETECTED		Cellulose (undulose)	2 Calcite + quartz + paint	5/3/2022
	<u>Layer</u> <u>Light green paint / gray concrete</u>						
	<u>Comments</u>						
202232865	1901-M-A06		NONE DETECTED		Cellulose (undulose)	2 Calcite + quartz + paint	5/3/2022
	<u>Layer</u> <u>Light green paint / gray concrete</u>						
	<u>Comments</u>						

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 Date Submitted: 4/26/2022
 Your Project: 19-3501 DOT Maui Highways Baseyard, 4/26/2022

Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v Matrix	Date Analyzed
202232866	1901-M-A07		NONE DETECTED		None detected	Calcite + binder + paint	5/3/2022
	<u>Layer</u> Off-white paint / white caulk						
	Comments						
202232867	1901-M-A08		NONE DETECTED		None detected	Calcite + binder + paint	5/3/2022
	<u>Layer</u> Off-white paint / white caulk						
	Comments						
202232868	1901-M-A09		NONE DETECTED		None detected	Calcite + binder + paint	5/3/2022
	<u>Layer</u> Off-white paint / white caulk						
	Comments						
202232869	1901-M-A10		NONE DETECTED		None detected	Calcite + quartz	5/3/2022
	<u>Layer</u> Gray / brown concrete						
	Comments						
202232870	1901-M-A11		NONE DETECTED		None detected	Calcite + quartz	5/3/2022
	<u>Layer</u> Gray / brown concrete						
	Comments						
202232871	1901-M-A12		NONE DETECTED		None detected	Calcite + quartz	5/3/2022
	<u>Layer</u> Gray / brown concrete						
	Comments						
202232872	1901-R-A01		NONE DETECTED		Cellulose (undulose)	2 Calcite + quartz + paint	5/3/2022
	<u>Layer</u> Off-white paint / gray concrete						
	Comments						
202232873	1901-R-A02		NONE DETECTED		Cellulose (undulose)	2 Calcite + quartz + paint	5/3/2022
	<u>Layer</u> Off-white paint / gray concrete						
	Comments						

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Lab Job No: 202204194
 Date Submitted: 4/26/2022
 Your Project: 19-3501 DOT Maui Highways Baseyard, 4/26/2022

Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v Matrix	Date Analyzed
202232874	1901-R-A03		NONE DETECTED		Cellulose (undulose)	2 Calcite + quartz + paint	5/3/2022
	<u>Layer</u> Off-white paint / gray concrete						
	Comments						
202232875	1901-R-A04		NONE DETECTED		Cellulose (undulose)	2 Calcite + quartz + paint	5/3/2022
	<u>Layer</u> Off-white paint / gray concrete						
	Comments						
202232876	1901-R-A05		NONE DETECTED		None detected	Calcite + quartz	5/3/2022
	<u>Layer</u> Gray concrete						
	Comments						
202232877	1901-R-A06		NONE DETECTED		None detected	Calcite + quartz	5/3/2022
	<u>Layer</u> Gray concrete						
	Comments						
202232878	1901-R-A07		NONE DETECTED		Cellulose (undulose)	2 Calcite + quartz + paint	5/3/2022
	<u>Layer</u> Brown paint / gray concrete						
	Comments						
202232879	1901-R-A08		NONE DETECTED		Cellulose (undulose)	2 Calcite + quartz + paint	5/3/2022
	<u>Layer</u> Brown paint / gray concrete						
	Comments						
202232880	1901-R-A09		NONE DETECTED		Cellulose (undulose)	2 Calcite + quartz + paint	5/3/2022
	<u>Layer</u> Brown paint / gray concrete						
	Comments						
202232881	1901-S-A01		NONE DETECTED		None detected	Calcite + quartz	5/3/2022
	<u>Layer</u> Gray concrete						
	Comments						

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 Email: -

Lab Job No: 202204194
 Date Submitted: 4/26/2022
 Your Project: 19-3501 DOT Maui Highways Baseyard, 4/26/2022

Bulk Asbestos Determination

Sample No.	Your Sample ID / Description	Asbestos Present?	Type	%v/v	Other Fibrous	%v/v Matrix	Date Analyzed
202232882	1901-S-A02	None DETECTED	NONE DETECTED		None detected	Calcite + quartz	5/3/2022
	<u>Layer</u> <u>Gray concrete</u>						
	Comments						
202232883	1901-S-A03	None DETECTED	NONE DETECTED		None detected	Calcite + quartz	5/3/2022
	<u>Layer</u> <u>Gray concrete</u>						
	Comments						

General Comments

The bulk sample[s] analysis subject of this analytical report were conducted in general accordance with the procedures outlined in the United States Environmental Protection Agency's "Interim Method for the Determination of Asbestos in Bulk Insulation Samples" (EPA-600/M4-82-020, Dec. 1982) and / or "Method for Determination of Asbestos in bulk Building Materials" (EPA-600/R-93-116, July 1993). The analysis of each bulk sample relates only to the material examined, and may or may not represent the overall composition of its original source. Floor tile and other resinously bound materials, when analyzed by the EPA methods referenced above may yield false negative results because of limitations in separating closely bound fibers and in detecting fibers of small length and diameter. Alternative methods of identification, including Transmission Electron Microscopy (TEM) may or may not be applicable. We utilize calibrated visual area estimation on a routine basis and do not conduct point counting unless specifically requested to do so. Estimated error for the visual determinations presented are 75% relative (1 to 2%), 50% relative (3 to 5%); 25% relative (6 to 25%) and 20% (>26% v/v). We will not separate layers which in our opinion are not readily discernable. This report is not to be duplicated except in full without the expressed written permission of Hawaii Analytical Laboratory. This report must not be used by the client to claim product certification, approval or endorsement by NVLAP, NIST or any agency of Federal Government. Unless otherwise indicated, the sample condition at the time of receipt was acceptable.

Results and Symbols Definitions

> This testing result is greater than the numerical value listed.

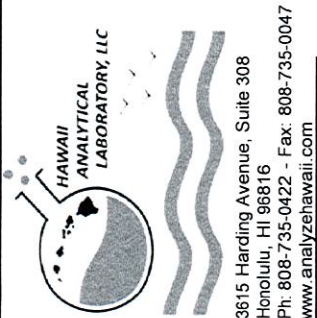
< This testing result is less than the numerical value listed.

None Detected = asbestos was not observed in the sample. If trace amount of asbestos was detected below our quantifiable limits of 1.0%, <1% (trace) would be indicated and the asbestos type listed. Point counting, where applicable, are recommended to improve accuracy.



Jennifer Hsu Liao
Laboratory Manager

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New Client?

Report To* : Antone Gabriel
 Company : ENVIROSERVICES & TRAINING CENTER, LLC
 Address* : 505 Ward Ave. Suite #202
 Honolulu, HI 96814
 Phone / Cell No.* : (808) 839-7222
 Report results to : Antone Gabriel
 via email or fax : agabriel@gotoetc.com, smarvin@gotoetc.com
 bcarroll@gotoetc.com, jcorpus@gotoetc.com

Invoice To* : Antone Gabriel
 Company : ENVIROSERVICES & TRAINING CENTER, LLC
 Address* : 505 Ward Ave. Suite #202
 Honolulu, HI 96814
 Phone / Cell No.* : (808) 839-7222
 Purchase Order No. :
 Email Invoice To : agabriel@gotoetc.com

Need Results By*:

5 Working Days (WD)
 4 WD
 3 WD
 2 WD
 24 hours
 6 hours or less
 4 hours or less
 1-2 hours

Sample Identification / Description* (Maximum of 30 Characters)	Date Sampled* (mm/dd/yy)	Collection Medium	Sample Area / Air Volume	Analysis Requested*	Method Reference	LAB USE ONLY Lab Report No.:
1901-F-A01 to A03	4/26/2022	Bulk	20232842	PLM	20232843	202204194
1901-F-A04 to A06	4/26/2022	Bulk	20232845	PLM	20232846	202232847
1901-F-A07 to A09	4/26/2022	Bulk	20232848	PLM	20232849	202232850
1901-F-A10 to A12	4/26/2022	Bulk	20232851	PLM	20232852	202232853
1901-F-A13 to A15	4/26/2022	Bulk	20232854	PLM	20232855	202232856
1901-F-A16 to A18	4/26/2022	Bulk	20232857	PLM	20232858	202232859
1901-M-A01 to A03	4/26/2022	Bulk	20232860	PLM	20232861	202232862
1901-M-A04 to A06	4/26/2022	Bulk	20232863	PLM	20232864	202232865
1901-M-A07 to A09	4/26/2022	Bulk	20232866	PLM	20232867	202232868
1901-M-A10 to A12	4/26/2022	Bulk	20232869	PLM	20232870	202232871
1901-R-A01 to A03	4/26/2022	Bulk	20232872	PLM	20232873	202232874
1901-R-A04 to A06	4/26/2022	Bulk	20232875	PLM	20232876	202232877

Comments / Special Instructions: verbal results needed?

PLM POSITIVE STOP Instructions:
 Positive stop per SAMPLE
 Positive stop per LAYER

Site/Project Name: **DOT Maui Highways Baseyard**

Client Project No.: **19-3501**

Sampled By: **S. Marvin**

Relinquished By (Print and Sign): Sara Marvin

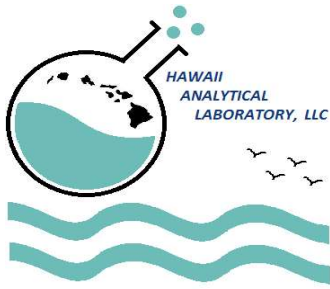
Date/Time: 4/28/2022

Received By (Print and Sign): Anne Antin

Date/Time: 04-28-22 11:25 RCVD

Sample description can be paint chips, concrete, specific sample collection location, etc...
 If matrix is 'soil', please specify if it is a FOREIGN SOIL SAMPLE (outside Hawaii) in the comment section.
 All samples submitted are subject to Hawaii Analytical Laboratory terms and conditions.
 *Required fields, failure to complete these fields may result in a delay in your samples being processed.

via FedEX via USPS via



Hawaii Analytical Laboratory ANALYTICAL REPORT

Thursday, May 5, 2022

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505 Ward Avenue, Suite 202
Honolulu HI 96814

Phone Number: (808)839-7222
Facsimile: (808) 839-4455
Email: -

Lab Job No: 202204193
Date Submitted: 4/28/2022
Your Project: 19-3501 DOT Maui Highways Baseyard, 4/26/2022

Total Lead (paint chips)

NIOSH Method: 7082m LEAD by FAAS

Sample No.	Your Sample ID / Description	Results	Units	Date Analyzed
202232827	1901-F-L01	< 40	mg/kg	5/3/2022
Comments	MRL = 40 mg/kg			
202232828	1901-F-L02	75000	mg/kg	5/3/2022
Comments	MRL = 110 mg/kg			
202232829	1901-F-L03	< 45	mg/kg	5/3/2022
Comments	MRL = 45 mg/kg			
202232830	1901-F-L04	< 40	mg/kg	5/3/2022
Comments	MRL = 40 mg/kg			
202232831	1901-F-L05	180	mg/kg	5/3/2022
Comments	MRL = 81 mg/kg			
202232832	1901-F-L06	< 50	mg/kg	5/3/2022
Comments	MRL = 50 mg/kg			
202232833	1901-F-L07	400	mg/kg	5/3/2022
Comments	MRL = 40 mg/kg			
202232834	1901-M-L01	< 40	mg/kg	5/3/2022
Comments	MRL = 40 mg/kg			

Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on www.aihaaccreditedlabs.org, in accordance with the recognized ISO/ IEC 17025:2005. AIHA is a NLLAP recognized accrediting body. Controlled doc.: Lead Report, rev. 3 – 20181015

3615 Harding Avenue, Ste. 308, Honolulu, HI 96816 - Telephone: (808) 735-0422 - Fax: (808) 735-0047

Page 1 of 3

EnviroServices & Training Center, LLC
505 Ward Avenue, Suite 202
Honolulu HI 96814

Phone Number: (808)839-7222
Facsimile: (808) 839-4455
Email: -

Lab Job No: 202204193
Date Submitted: 4/28/2022
Your Project: 19-3501 DOT Maui Highways Baseyard, 4/26/2022

Total Lead (paint chips)

NIOSH Method: 7082m LEAD by FAAS

Sample No.	Your Sample ID / Description	Results	Units	Date Analyzed
202232835	1901-M-L02	< 41	mg/kg	5/3/2022
Comments	MRL = 41 mg/kg			
202232836	1901-M-L03	95	mg/kg	5/3/2022
Comments	MRL = 42 mg/kg			
202232837	1901-R-L01	< 40	mg/kg	5/3/2022
Comments	MRL = 40 mg/kg			
202232838	1901-R-L02	180	mg/kg	5/3/2022
Comments	MRL = 43 mg/kg			
202232839	1901-R-L03	3800	mg/kg	5/3/2022
Comments	MRL = 86 mg/kg			
202232840	1901-R-L04	84	mg/kg	5/3/2022
Comments	MRL = 64 mg/kg			
202232841	1901-S-L01	< 40	mg/kg	5/3/2022
Comments	MRL = 40 mg/kg			

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Page 2 of 3

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All Quality Control data are acceptable unless otherwise noted.

MRL for lead air is 5ug.

MRL for lead wipe is 10ug.

MRL for lead paint or soil is 40 mg/kg for a 0.25g sample.

General Comments

The sample[s] analysis subject of this analytical report were conducted in general accordance with the procedures associated with the "analytical method" referenced above. Modifications to this methodology may have been made based upon the analyst's professional judgment and / or sample matrix effects encountered. The analysis of sample relates only to the sample analyzed, and may or may not be representative of the original source of the material submitted for our analysis. All analysts participate in interlaboratory quality control testing to continuously document proficiency. This report is not to be duplicated except in full without the expressed written permission of Hawaii Analytical Laboratory. This report should not be construed as an endorsement for a product or a service by the AIHA LAP, LLC or any affiliated organizations. Sample and associated sampling / collection data is reported as provided by client. TWA values have been calculated based on information supplied by the client that the laboratory has not independently verified. Results have not been corrected for blank determinations unless noted in remarks. Unless otherwise indicated the sample condition at the time of receipt was acceptable.

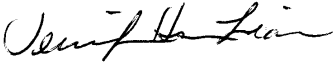
Results and Symbols Definitions

> This testing result is greater than the numerical value listed.

< This testing result is less than the numerical value listed.

= Analytical methods marked with an "#" are not within our AIHA LAP, LLC Scope of Accreditation.

MRL = Method Reporting Limit.



Jennifer Hsu Liao
Laboratory Manager

Hawaii Analytical Laboratory (101812) is accredited by the AIHA LAP, LLC in the EMLAP, IHLAP, and ELLAP programs for the scope of work listed on www.aihaaccreditedlabs.org, in accordance with the recognized ISO/ IEC 17025:2005. AIHA is a NLLAP recognized accrediting body. Controlled doc.: Lead Report, rev. 3 – 20181015

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Appendix **III**

HOMOGENEOUS AREA MAP

LIMITED HAZARDOUS MATERIALS SURVEY

**MAUI BASEYARD
650 PALAPALA DRIVE
KAHULUI, HI**

LEAD HOMOGENEOUS AREA MAP

LEGEND:

● Lead-based yellow paint on bollards

● Lead-containing brown paint on pillars

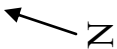
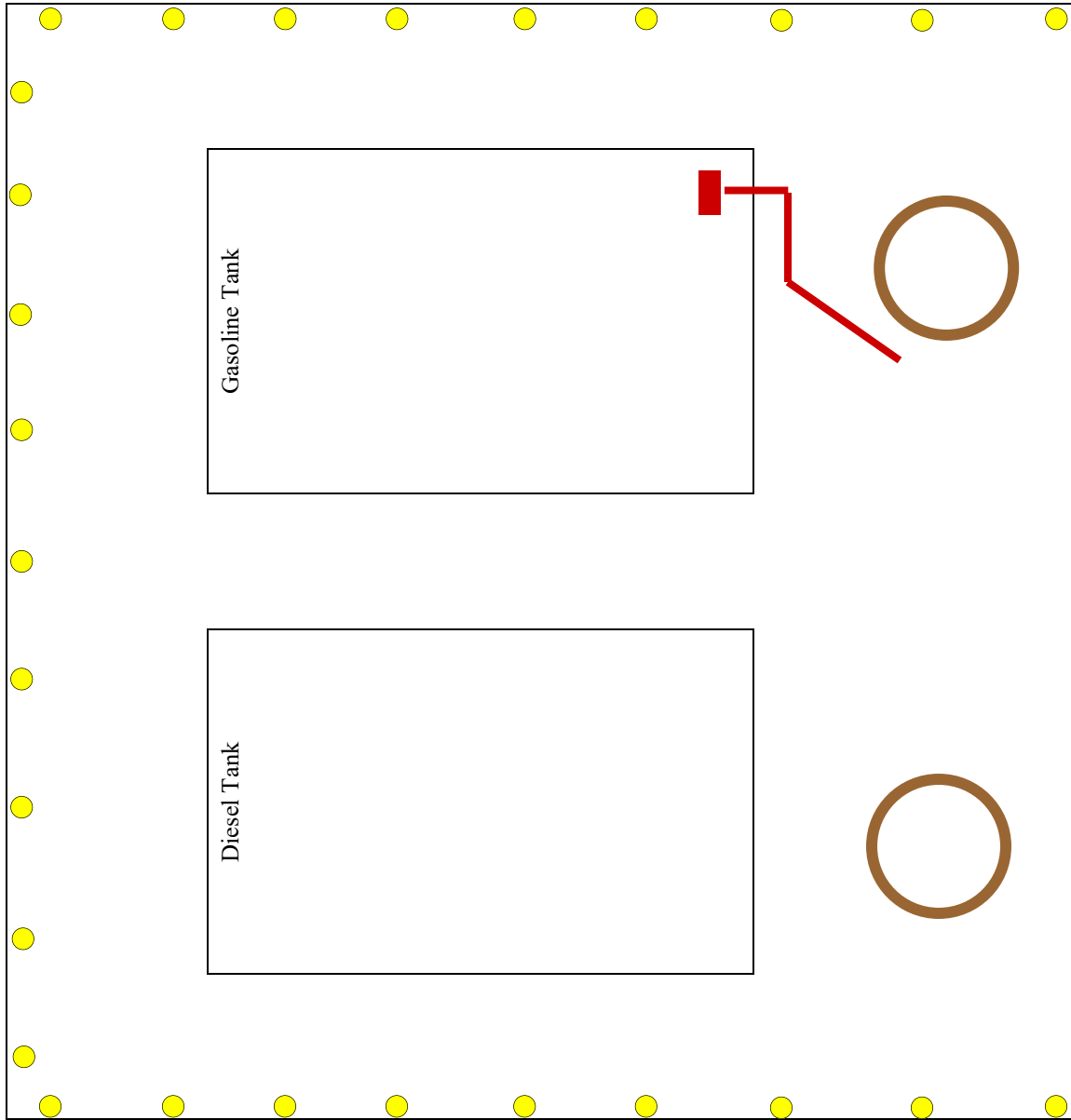
█ Lead-containing red paint on motor and piping

650 Palapala Drive,
Kahului, HI 96732

Building: **FUEL STATION**
NOT TO SCALE

ETC Project No. 19-3501

May 2022





**LIMITED HAZARDOUS
MATERIALS SURVEY**

**MAUI BASEYARD
650 PALAPALA DRIVE
KAHULUI, HI**

**LEAD HOMOGENEOUS
AREA MAP**

LEGEND:

Lead-containing off-white paint on
conduit

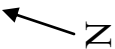
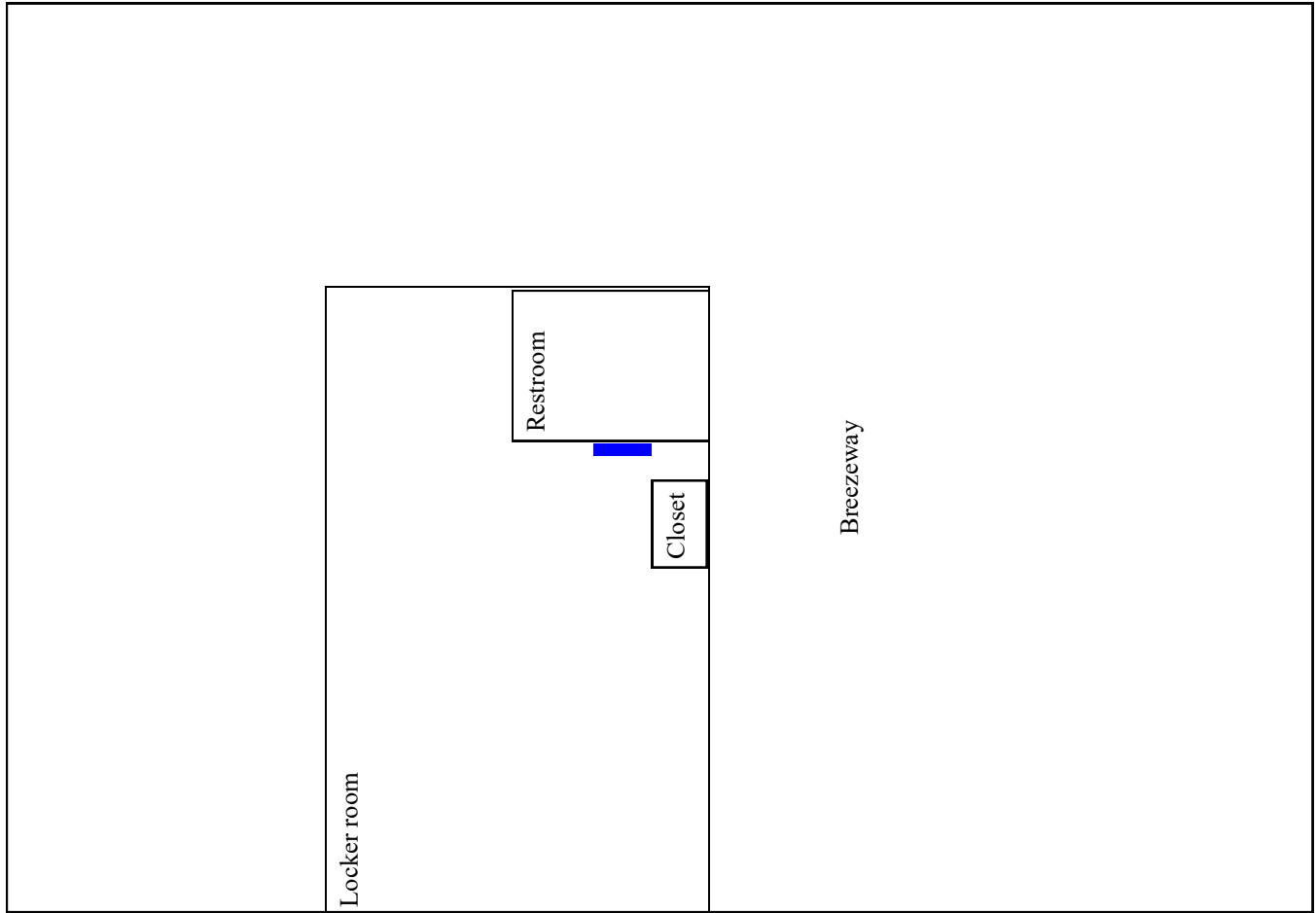


650 Palapala Drive,
Kahului, HI 96732

Building: **MAINTENANCE
BUILDING**
NOT TO SCALE

ETC Project No. 19-3501

May 2022







**LIMITED HAZARDOUS
MATERIALS SURVEY**


**MAUI BASEYARD
650 PALAPALA DRIVE
KAHULUI, HI**

**LEAD HOMOGENEOUS
AREA MAP**

LEGEND:

 Lead-containing brown paint on exterior CMU walls

 Lead-containing grey paint on exterior conduit & junction box

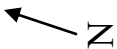
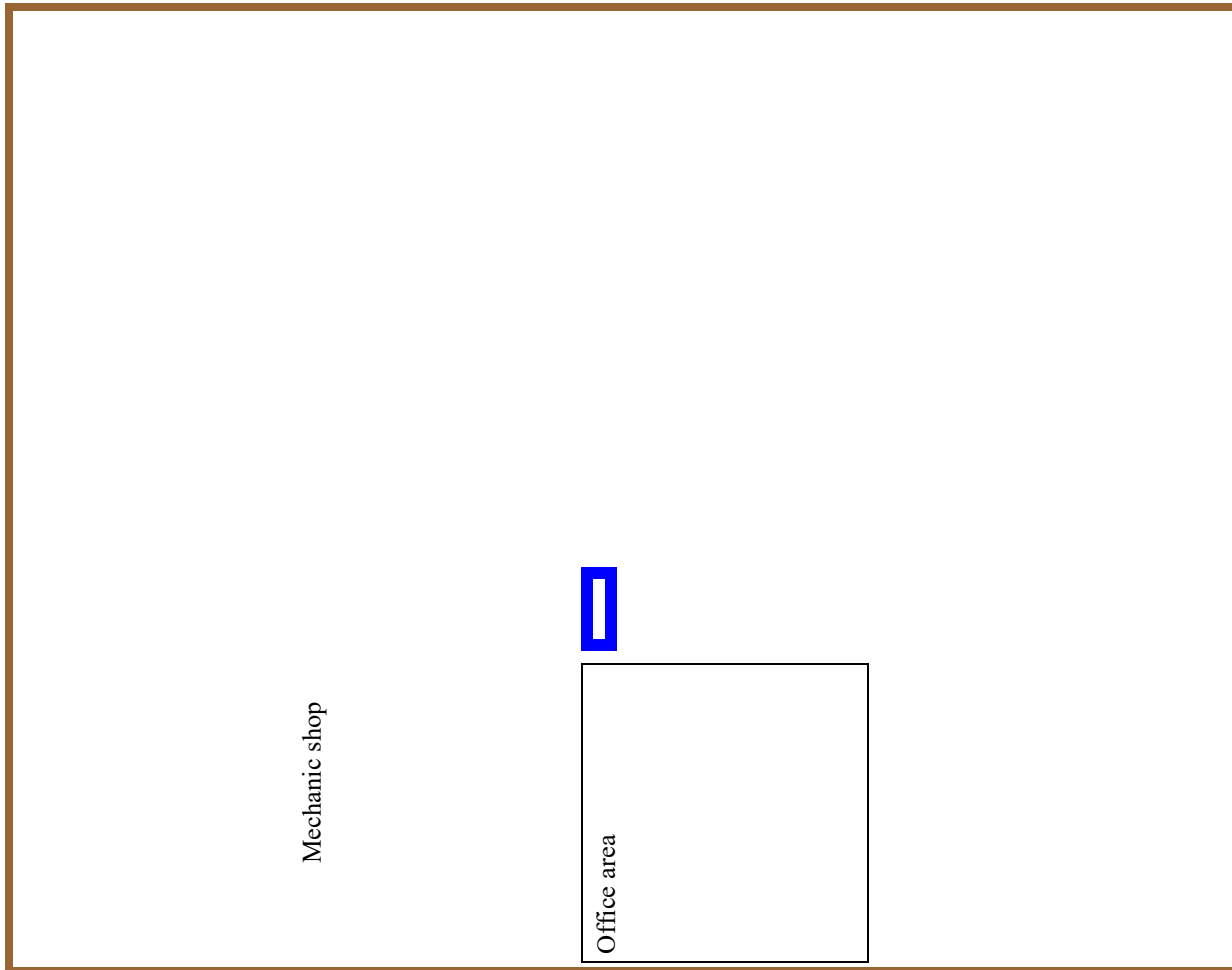
 Lead-containing off-white paint on interior conduit

650 Palapala Drive,
Kahului, HI 96732

Building: REPAIR SHOP
NOT TO SCALE

ETC Project No. 19-3501

May 2021



Appendix **IV**

PHOTOGRAPHIC DOCUMENTATION

Lead-Based Paint



Photograph 1: Yellow paint on fuel station parking bollards
Sample ID 1901-F-L02



Page 1 of 7

May 2022

Photographic Documentation
Limited Hazardous Materials Survey
Maui Baseyard
Kahului, Maui

Lead-Containing Paints



Photograph 2: Red paint on fuel tank motor and pipes
Sample ID 1901-F-L05



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May 2022

Photographic Documentation
Limited Hazardous Materials Survey
Maui Baseyard
Kahului, Maui

Lead-Containing Paints



Photograph 3: Brown paint on fuel station canopy pillars
Sample ID 1901-F-L07



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May 2022

Photographic Documentation
Limited Hazardous Materials Survey
Maui Baseyard
Kahului, Maui

Lead-Containing Paints



Photograph 4: Off-white paint on maintenance building interior conduit
Sample ID 1901-M-L03



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May 2022

**Photographic Documentation
Limited Hazardous Materials Survey
Maui Baseyard
Kahului, Maui**

Lead-Containing Paints



Photograph 5: Off-white paint on repair shop interior conduit
Sample ID 1901-R-L02

Lead-Containing Paints



Photograph 6: Grey paint on repair shop exterior conduit and junction box
Sample ID 1901-R-L03

Lead-Containing Paints



Photograph 7: Brown paint on repair shop exterior CMU walls
Sample ID 1901-R-L04



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May 2022

Photographic Documentation
Limited Hazardous Materials Survey
Maui Baseyard
Kahului, Maui

SECTION 01770 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including the following:
1. Project Record Documents.
 2. Operation and Maintenance Manuals.
 3. Warranties.
 4. Instruction for the State's personnel.

1.02 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting a Final Inspection to determine Substantial Completion, complete the following items in addition to requirements of the General Requirements.
1. Advise the Contracting Officer of pending insurance changeover requirements.
 2. Submit specific warranties, final certifications, and similar documents.
 3. Obtain and submit operating certificates, and similar releases and access to services and utilities, unless waived by the Contracting Officer.
 4. Arrange to deliver tools, spare parts, extra materials, and similar items to a location designated by the Contracting Officer. Label with manufacturer's name and model number where applicable.
 5. Complete startup testing of systems.
 6. Submit test, adjust, and balance records.
 7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 8. Advise the Contracting Officer of changeover in other utilities.
 9. Submit changeover information related to the State's occupancy, use, operation and maintenance.
 10. Complete final cleaning requirements, including touch up painting.
 11. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
 12. Submit the O&M Manual(s) for review.

1.03 FINAL COMPLETION

- A. Preliminary Procedures: Within 10 days from the Project Acceptance Date, complete the following items in addition to requirements of General Requirements.
 1. Instruct the State's personnel in operation, adjustment, and maintenance of products, equipment, and systems. Submit demonstration and training media materials.

1.04 LIST OF INCOMPLETE ITEMS (PUNCHLIST)

- A. Preparation: Submit 2 copies of any updated and action taken list. In addition to conditions of the General Requirements, include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor.
 2. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.

1.05 PROJECT RECORD DOCUMENTS AND REQUIREMENTS

- A. General:
 1. Definition: "Project Record Documents", including Record Drawings, shall fulfill the requirements of "Field-Posted As-Built Drawings".
 2. Do not use Project Record Documents for daily construction purposes. Protect Project Record Documents from deterioration and loss. Provide access to Project Record Documents for Contracting Officer's reference during normal working hours. Maintain these documents as specified in paragraph entitled "Record Drawings" hereinafter.
 3. The Designer, under contract with the State, will update the drawings to show all addendum, PCD, and sketch changes. The Contracting Officer will transmit these drawings to the Contractor who will make all "red-line" corrections to these drawings to record the changes depicted on the Contractor's Field Posted Record ("As-Built") by accepted drafting practices as approved by the Contracting Officer.
 4. Where the recorded changes depicted on the Contractor's Field Posted Record ("As-Built") are in the form of shop drawings, the Contractor shall provide those shop drawings electronically on the same sheet size as the drawings transmitted to the Contractor. The new drawing sheets shall be titled and numbered to conform to the construction drawings and clearly indicate what information they supersede in the actual construction drawings. For example, a new drawing that replaces drawing M300, could be numbered M300a.
 5. The Contractor shall bring to the attention of the Contracting Officer any discrepancy between the changes made by the Designer and those depicted on addendum, PCD, and sketch changes. The Contracting Officer will resolve any conflicts.
 6. Submit final Record Documents (Field Posted Record Drawings) before the Final Inspection Date and no later than the Contract Completion Date.

7. The Contractor shall guarantee the accuracy of its final Record Documents. The State will hold the Contractor liable for costs the State incurs as a result of inaccuracies in the Contractor's Record Documents.
8. Deliver tools, spare parts, extra materials, and similar items to a location designated by the Contracting Officer. Label with manufacturer's name and model number where applicable.
9. If requested by the Contracting Officer, prepare the pest-control final inspection report and warranty.
10. Submit Final, corrected O&M Manual(s).

B. Record Drawings:

1. Maintain a duplicate full-size set as the Field Posted Record ("As-Builts") Drawings at the job site. Clearly and accurately record all deviations from alignments, elevations and dimensions, which are stipulated on the drawings and for changes directed by the Contracting Officer that deviate from the drawings.
2. Record changes immediately after they are constructed in place and where applicable, refer to the authorizing document (Field Order, Change Order, or Contract Modification). Use red pencil to record changes. Make Field Posted Record Drawings available to the Contracting Officer at any time so that its clarity and accuracy can be monitored and can be countersigned for validity.
 - a. Give particular attention to information on concealed elements that cannot be readily identified and recorded later.
 - b. Accurately record information in an understandable drawing technique.
 - c. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
 - d. Mark the contract drawings or the shop drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where Shop Drawings are marked, show cross-reference on contract drawings.
 - e. Mark important additional information that was either shown schematically or omitted from original Drawings.
 - f. Locate concealed building utilities by dimension from bench marks or permanent structures. Locate site utilities by dimensions, azimuth and lengths from bench marks or permanent structures.
 - g. Note field order numbers, Change Order numbers, Contract Modification numbers, Alternate numbers, post-construction drawing numbers (PCD) and similar identification (RFI numbers) where applicable.
 - h. The Contractor shall initial each deviation and each revision marking.

3. Use the final updated Contract Drawing set (including all addenda, PCD, and sketches) plus applicable shop drawings for making the final Field Posted Record Drawings submittal.
4. Certify drawing accuracy and completeness. Label and sign the record drawings or use digital electronic signature as approved by the Contracting Officer.
5. Label the title sheet and on all sheets in the margin space to the right of the sheet number, written from the bottom upward, with the title "FIELD POSTED RECORD DRAWINGS" and certification information as shown below. Provide a signature line and company name line for each subcontractor that will also certify the respective drawing. Adjust size to fit margin space.

FIELD POSTED Certified By: _____ Date: _____
 RECORD DRAWINGS [Contractor's Company Name]

6. Revise the Drawing Index and label the set "FIELD POSTED RECORD DRAWINGS". Include the label "A COMPLETE SET CONTAINS [_____] SHEETS" in the margin at the bottom right corner of each sheet. Quantify the total number of sheets comprising the set.
7. If the Contracting Officer determines a drawing does not accurately record a deviation or omits relevant information, the State will correct any FIELD POSTED RECORD DRAWINGS sheet. Contractor will be charged for the State's cost to correct the error or omission.
8. Use the final Field Posted Record Drawings sheets and create one electronic version of the set. The set shall be recorded in Adobe Acrobat PDF (Portable Document Format). Create a single indexed, bookmarked PDF file of the entire set of drawings.

1.06 WARRANTIES

- A. Submittal Time: Submit written manufacturer's warranties at request of the Contracting Officer for designated portions of the Work where commencement of warranties other than Project Acceptance date is indicated.
- B. Partial Occupancy: Submit properly executed manufacturer's warranties within 45 days of completion of designated portions of the Work that are completed and occupied or used by the State during construction period by separate agreement with Contractor.
- C. Organize manufacturer's warranty documents into an orderly sequence based on the table of contents of the Specifications.
 1. Bind warranties and bonds in heavy-duty, 3-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2 inch x 11-inch paper.
 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer and prime contractor.

3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES", Project Name and Title, DOT Job Number, and name of Contractor.
4. Use the final submittal of the warranties to create an electronic Adobe Acrobat PDF (Portable Document Format) version of the bound warranty documents files. Each sheet shall be separately scanned, at 600 DPI or better into a PDF file.

1.07 OPERATION AND MAINTENANCE MANUALS

- A. Assemble complete set of operation and maintenance data indicating the operation and maintenance of each system, subsystem, and piece of equipment not part of a system. Include operation and maintenance data required in individual Specification Sections and as follows:
 1. Operation Data:
 - a. Emergency instructions and procedures.
 - b. System, subsystem, and equipment descriptions, including operating standards.
 - c. Operating procedures, including startup, shutdown, seasonal, and weekend operations.
 - d. Description of controls and sequence of operations.
 - e. Piping diagrams.
 2. Maintenance Data:
 - a. Manufacturer's information, Material Safety Data Sheets, and a list of spare parts.
 - b. Name, address, and telephone number of installer or supplier.
 - c. Maintenance procedures.
 - d. Maintenance and service schedules for preventive and routine maintenance.
 - e. Maintenance record forms.
 - f. Sources of spare parts and maintenance materials.
 - g. Copies of maintenance service agreements.
 - h. Copies of warranties and bonds.
- B. Use the following 3 paragraph headings, "Notes, Cautions and Warnings", to emphasize important and critical instructions and procedures. Place the words "Notes", "Cautions", or "Warnings" immediately before the applicable instructions or procedures. Notes, Cautions and Warnings are defined as follows:
 1. Note: Highlights an essential operating or maintenance procedure, condition or statement.

2. Caution: Highlights an operating or maintenance procedure, practice, condition or statement which if not strictly observed, could result in damage to or destruction of equipment, loss of designed effectiveness, or health hazards to personnel.
 3. Warning: Highlights an operating or maintenance procedure, practice, condition, or statement that if not strictly observed, could result in injury to or death of personnel.
- C. Organize the Operation and Maintenance Manuals into suitable sets of manageable size. Bind and index data in heavy-duty, "D" type 3-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, with pocket inside the covers to receive folded oversized sheets. Binder color shall be maroon, or if not available red. Identify each binder on front and spine with the printed title "OPERATION AND MAINTENANCE MANUAL", Project Name and Title include building number when appropriate, DOT Job Number, Prepared For: Department of Transportation, Prepared By: [Contractor] and Volume Number. Each binder is a single volume.
- D. Electronic Format
1. Provide all information (narratives, drawings and manual) in electronic PDF format. Provide Compact Disc (CD) or DVD if files are too large. Provide drawings and plans prepared for the O&M Manuals drawn electronically and saved as a PDF file. Name and index the files for ease of identification and updates.
 2. Provide the complete O&M Manual using Adobe Acrobat PDF (Portable Document Format) files. Each sheet shall be separately scanned into a PDF file, indexed, bookmarked, hyperlinked to the table of contents. Scanned documents shall be scanned at 600 DPI or better. Indexes and bookmarks may be highlighted or colored text.
- E. Pre-Final Submittal: Submit 1 printed set of Final Operation and Maintenance Manual, for review by the Contracting Officer, at least 5 days prior to scheduled final inspection. Manuals shall be marked as Pre-Final.
1. Make any correction noted before submitting the final Operation and Maintenance Manuals.
 2. The set will be returned with comments. Additional review comments may include problems discovered during the O&M Manual's review, site validation, and facility start up and will be provided to the Contractor after facility Project Acceptance Date.
- F. Final Submittal: Use the final submittal of the manuals to create the electronic PDF file version of the bound Operation and Maintenance Manuals documents. Include the Submittal (100 percent) review comments along with a response to each item. Final printed manual and any disks shall be marked as Final and sent to the Contracting Officer.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.01 DEMONSTRATION AND TRAINING

- A. Instruction: Instruct the State's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 1. Provide instructors experienced in operation and maintenance procedures.
 2. Provide instruction at mutually accepted times.
 3. Schedule training with the State's users, through the Contracting Officer with at least seven (7) days advanced notice.
 4. Coordinate instructors, including providing notification of dates, times, length of instruction, and course content.

3.02 FINAL CLEANING

- A. General: Provide final cleaning. In addition to requirements of the General Requirements, provide cleaning and waste-removal operations to comply with local laws and ordinances and federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturers written instructions unless noted otherwise. Complete the following cleaning operations before requesting final inspection for entire Project or for a portion of Project:
 1. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits resulting from construction activities.
 3. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 4. Remove tools, construction equipment, machinery, and surplus material from Project site.
 5. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

6. Remove debris and surface dust from limited access spaces, including: roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 7. Sweep concrete floors broom clean in unoccupied spaces.
 8. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass surfaces, taking care not to scratch surfaces.
 9. Remove labels that are not permanent.
 10. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.
 - a. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 11. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 12. Replace parts subject to unusual operating conditions.
 13. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 14. Replace disposable air filters and clean permanent air filters. Clean the exposed surfaces of diffusers, registers, and grills.
 15. Clean ducts, blowers, and coils if units were operated without filters during construction.
 16. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
 17. Leave Project clean and ready for occupancy.
- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the State's property. Do not discharge volatile, harmful, or dangerous materials into drainage and sewer systems or onto State property. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION

DIVISION 2 – SITE CONSTRUCTION

SECTION 02070 – SELECTIVE DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes the following:
 - 1. Demolition and removal of select portions of a building or structure.
 - 2. Repair procedures for selective demolition operations.
- B. Related Sections include the following:
 - 1. Section 01100 - Project Requirements.
 - 2. Section 01567 – Environmental Protection.
 - 3. Section 01715 – Existing Conditions – Hazardous Materials Survey.
 - 4. Section 01500 - Temporary Facilities and Controls.
 - 5. Section 13282 – Lead-Containing Paint Control Measures.
 - 6. Section 13288 – Testing and Air Monitoring.

1.02 DEFINITIONS

- A. Remove / Demolish: Detach items from existing construction and legally dispose of them off-site, unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Detach items from existing construction and deliver them to State ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, prepare them for reuse, and reinstall them where indicated.
- D. Existing to Remain: Items of construction that are not to be removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.03 MATERIALS OWNERSHIP

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain State's property, demolished materials shall become the Contractor's property and shall be removed from Project site.

1.04 SUBMITTALS

- A. Submit in accordance with Section 01330 Submittal Procedures.
- B. Demolition Plan: As described in paragraph 3.01 of this Section.
- C. Inventory: After selective demolition is complete, submit a list of items that have been removed and salvaged.

1.05 QUALITY ASSURANCE

- A. Demolition Firm Qualifications: An experienced firm that has specialized in demolition work similar in material and extent to that indicated for this Project.
- B. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. All work shall be performed in accordance with all Federal, State and County of Maui regulations and the requirements of the Occupational Safety and Health Act, State Industrial Safety Orders, and State and County of Maui Building Codes.
- C. Standards: Comply with ANSI A10.6 and Uniform Fire Code, 1997 Edition, Article 87.
- D. Select demolition shall be performed in such a manner as to not harm adjacent structures, substructures, utilities, or any other existing improvements. The Contractor shall assume full responsibility for such disturbance. All costs of any such repair, rehabilitation, or modifications shall be borne by the Contractor.

1.06 PROJECT CONDITIONS

- A. The State will occupy portions of site immediately adjacent to selective demolition areas. Conduct selective demolition so State's operations will not be disrupted. Provide not less than 72 hours' notice to the Contracting Officer of activities that will affect State's operations.
- B. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
 - 1. Do not close or obstruct walkways, corridors or other occupied facilities or facilities in use without written permission from authorities having jurisdiction.
- C. State assumes no responsibility for condition of areas to be selectively demolished.
 - 1. State will maintain conditions existing at time of inspection for bidding purpose as far as practical.
- D. Storage or sale of removed items or materials on-site is not permitted.
- E. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

PART 2 - PRODUCTS

2.01 REPAIR MATERIALS

- A. Use repair materials identical to existing materials, unless otherwise specified.
 - 1. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible, and notify the Contracting Officer.
 - 2. Use materials whose installed performance equals or surpasses that of existing materials.

- B. Comply with material and installation requirements specified in individual Specification Sections.

PART 3 - EXECUTION

3.01 EXAMINATION

- A. Verify that utilities have been disconnected, capped, or relocated.
- B. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- C. Demolition Plan: Prior to starting work, the Contractor shall submit a Demolition Plan and list of procedures for performing the demolition and removal work. The plan shall be approved by the Contracting Officer. Procedures shall include provisions for safe conduct of the work, removal, disposition of items to be salvaged, protection of property to remain, pedestrian and vehicular traffic, coordination with other work, timely disconnection of utilities, and a schedule of the sequence of operations.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Contracting Officer.
- E. Perform surveys as the work progresses to detect hazards resulting from selective demolition activities.

3.02 UTILITY SERVICES

- A. Existing Utilities: Maintain services indicated to remain and protect them against damage during selective demolition operations.
- B. Do not interrupt existing utilities serving occupied or operating facilities unless authorized in writing by Contracting Officer. Provide temporary services during interruptions to existing utilities, as acceptable to the Contracting Officer and to authorities having jurisdiction.
 - 1. Provide at least 72 hours' notice to Contracting Officer if shutdown of service is required during changeover.
- C. Utility Requirements: Locate, identify, disconnect, and seal or cap off indicated utilities serving areas to be selectively demolished.
 - 1. Arrange to shut off indicated utilities with utility companies.
 - 2. If utility services are required to be removed, relocated, or abandoned, before proceeding with selective demolition provide temporary utilities that bypass area of selective demolition and that maintain continuity of service to other parts of building.

3.03 PREPARATION

- A. Refer to Sections 01100 Project Requirements and Section 01500 Temporary Facilities and Controls for requirements.

- B. Refer to Section 01715 Existing Conditions – Hazardous Materials Survey and perform work as necessary as delineated in Section 13282 – Lead-Containing Paint Control Measures and Section 13288 – Testing and Air Monitoring.

3.04 POLLUTION CONTROLS

- A. Dust Control: Use temporary enclosures, and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations.
 - 1. Do not use water when it may damage existing construction or create hazardous or objectionable conditions, such as flooding and pollution.
 - 2. Wet mop floors to eliminate trackable dirt and wipe down walls and doors of demolition enclosure. Vacuum carpeted areas.
- B. Disposal: Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
 - 1. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- C. Cleaning: Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

3.05 SELECTIVE DEMOLITION

- A. General: Demolish and remove existing construction only to the extent required by new work and as indicated. Use methods required to complete the work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from higher to lower level.
 - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 4. Do not use cutting torches.
 - 5. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 6. Dispose of demolished items and materials promptly.
 - 7. Return elements of construction and surfaces that are to remain to condition existing before selective demolition operations began.
- B. Removed and Salvaged Items: Comply with the following:
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers.

3. Store items in a secure area until delivery to State.
 4. Transport items to storage area designated by the State.
 5. Protect items from damage during transport and storage.
- C. Removed and Reinstalled Items: Comply with the following:
1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide new connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Contracting Officer, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.
- E. Sealants: Remove no more existing sealants in joints that can be resealed by new sealant in one day by new sealant, including substrate preparation. Prepare no more new joints that can be sealed in one day.

3.06 PATCHING AND REPAIRS

- A. General: Promptly repair damage to adjacent construction caused by selective demolition operations.
- B. Repairs: Where repairs to existing surfaces are required, patch to produce surfaces suitable for new materials.
1. Completely fill holes and depressions in existing walls that are to remain with an approved patching material applied according to manufacturer's written recommendations.
- C. Where reroofing or roof repairs/patching occurs, provide temporary roof protection measures to prevent water and wind-borne rain from entering the building until the final roof is installed or repairs are made.
- D. Finishes: Restore exposed finishes of patched areas and extend restoration into adjoining construction to the nearest break in the surface, change in material, or as approved by the Contracting Officer in order to eliminate evidence of patching and refinishing.

3.07 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Promptly dispose of demolished materials. Do not allow demolished materials to accumulate on-site.

- B. Burning: Do not burn demolished materials.
- C. Disposal: Transport demolished materials off State's property and legally dispose of them.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

- A. All work specified in this section shall not be measured nor paid for separately but shall be considered incidental to Bid Item No. 5 – Electrical Work, of the Proposal and Proposal Schedule. The final payment will not be made until a signed copy of the manifest from the treatment or disposal facility certifying the amount of lead-contaminated material delivered is submitted to the State.

END OF SECTION

DIVISION 2 - SITE CONSTRUCTION

SECTION 02100 - SITE PREPARATION

PART 1 - GENERAL

1.01 SUMMARY

- A. Section Includes:
 - 1. Removal and disposal of unwanted material for areas of proposed development or improvement.
 - 2. The work to be performed under this Section shall include clearing the premises of all obstacles and obstructions, the removal of which will be necessary for the proper reception, construction, execution and completion of the other work included in this contract; to accumulate and dispose of all debris and waste materials; to lay out the entire work.
- B. Related Sections include the following:
 - 1. Section 01100 - Project Requirements.
 - 2. Section 01567 - Environmental Protection.
 - 3. Section 01715 - Existing Conditions – Hazardous Materials Survey.
 - 4. Section 01500 - Temporary Facilities and Controls.
 - 5. Section 02070 - Selective Demolition.
 - 6. Section 02370 - Sediment and Erosion Control.
 - 7. Section 03300 - Cast-in-Place Concrete.
- C. Contractor shall procure and pay for all necessary permits and certificates that may be required in conjunction with this work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 GENERAL CONSIDERATIONS

- A. Conditions of Premises: The Contractor shall examine the site and become familiar with the existing conditions and the amount and kind of work to be performed.
- B. Prepare Demolition Plan as delineated in Section 02100 Selective Demolition. No demolition work shall commence without approval of Demolition Plan by the Contracting Officer.

- C. The Contractor shall keep the work area thoroughly wetted down to prevent dirt and dust from becoming airborne and transporting. All water lines required for this purpose shall be provided by the Contractor.
- D. Protection
 - 1. Throughout the progress of the work, protection shall be provided for all property and equipment, and temporary barricades shall be provided as necessary.
 - 2. Work shall be done in accordance with Federal, State and County of Maui environmental regulations and the safety provisions of the current edition of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America and the State of Hawaii's Occupational Safety and Health (HIOSH) standards, rules and regulations.
- E. Install and maintain erosion and sediment control in accordance with Section 02370 Sediment and Erosion Control.
- F. When necessary and as directed by the Contracting Officer, the Contractor shall provide and erect barriers, etc., with special attention to protection of public and personnel at no additional cost to the State.
- G. When necessary and as directed by the Contracting Officer, the Contractor shall provide and erect traffic control devices and barriers, etc., at no additional cost to the State.
- H. Fires: No burning of fires of any kind will be allowed.
- I. Reference Points: Bench marks, etc., shall be carefully maintained, but if disturbed or destroyed, shall be replaced as directed, at the Contractor's expense.
- J. Disposal
 - 1. All materials resultant from operations under this Section shall become the property of the Contractor and shall be removed from the site in accordance with Federal, State, and County regulations, at his expense.
 - 2. Unless otherwise directed by Contracting Officer, Contractor shall remove accumulated debris daily and shall not allow debris to accumulate onsite. Materials that are not removed daily shall be stored only in areas approved by the Contracting Officer.
 - 3. Loads of materials shall be trimmed to prevent droppings.
- K. Landfill Disposal or Recycling Manifest: Submit certified disposal and recycling manifest documenting proper transit and disposal of demolition materials. Receipt of certified manifests shall be requirement prior to progress payment for disposal or recycling. Submit manifests with the Contractor Daily Progress Report.

3.02 EXISTING UTILITY LINES

- A. The Contractor shall tone for and locate all existing utilities and determine requirements for disconnection, capping, and/or protection.

- B. Should any unknown line be encountered during excavation, the Contractor shall immediately notify the Contracting Officer of such discovery. The Contracting Officer shall then investigate and issue instructions for the preservation or disposition of the unknown line. Authorization for extra work shall be issued by the Contracting Officer only as he deems necessary.

3.03 MAINTAINING TRAFFIC

- A. Conduct operations and schedule work for minimum interference to streets, driveways, sidewalks, etc. Confine all work, equipment, materials and personnel, as much as possible, to the work area as indicated so as not to interfere with the normal function of adjacent streets and site operations.

3.04 CLEAN UP OF PREMISES

- A. Clean up debris accumulated from construction operations from time to time as directed. Upon completion of the construction work and before final acceptance of contract work, remove all surplus materials, equipment, scaffoldings, etc., and leave entire job site raked clean and neat to the satisfaction of the Contracting Officer.
- B. Upon completion of the project, existing drain inlets, catch basins, and drainage ways adjacent to the project shall be inspected. Any accumulated sediment and debris found in the drain inlet, catch basin, or drainage way shall be removed and disposed of properly. Flushing into the drainage system is prohibited.

3.05 LAYOUT

- A. The establishment of grades and staking out the entire work shall be done by a Surveyor or Civil Engineer (licensed in the State of Hawaii) at the expense of the Contractor and he shall be solely responsible for their accuracy. The Contractor shall erect and maintain substantial batter boards showing construction lines and levels.
- B. Should any discrepancies be discovered in the dimensions given in the plans, the Contractor shall immediately notify the Contracting Officer before proceeding any further with the work, otherwise, he will be held responsible for any costs involved in correction of construction placed due to such discrepancy.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

- A. All work specified in this section shall not be measured nor paid for separately but shall be considered incidental to Bid Item No. 2 – Site Preparation – Fuel Station and Bid Item No. 5 – Electrical Work, of the Proposal and Proposal Schedule. The final payment will not be made until a signed copy of the manifest from the treatment or disposal facility certifying the amount of lead-contaminated material delivered is submitted to the State.

END OF SECTION

SECTION 02200 – EARTHWORK

PART 1 – GENERAL

1.01 SUMMARY

- A. Furnish all labor, materials, tools, and equipment for any and all earthwork.
- B. Related Sections include the following:
 - 1. DIVISION 1 – GENERAL REQUIREMENTS for restrictions on use of the premises and Owner-occupancy requirements.
 - 2. Section 02370 – Sediment and Erosion Control.
- C. Contractor shall procure and pay for all necessary permits and certificates that may be required in conjunction with this work.

1.02 REFERENCES

- A. The “Standard Specifications for Public Works Construction”, September 1986, of the Department of Public Works, as applicable to the County of Maui, hereafter referred to as the “DPW Standard Specifications”, or as herein specified. (Paragraphs concerning Measurement and Payment are not applicable to this project.)
- B. The “2005 Standard Specifications for Road and Bridge Construction”, State of Hawaii, Department of Transportation, hereafter referred to as the “DOT Standard Specifications.” (Paragraphs concerning Measurement and Payment are not applicable to this project.)
- C. “Geotechnical Engineering Exploration, Site Improvements at DOT Kahului Baseyard Kahului, Maui, Hawaii,” prepared by Kokua Geotech LLC dated August 7, 2020, included in these Specifications as Attachment E.

1.03 QUALITY ASSURANCE

- A. Codes and Standards: Comply with the codes, specifications, and standards, referred to in this specification, except where provisions in this specification or drawings exceed such requirements.
- B. Source Quality Control: Test import materials proposed for use to demonstrate that the materials conform to the specified requirements. Tests shall be performed by an independent testing laboratory and paid for by the Contractor.
- C. Field Dry Density and Moisture Content Tests: Submit field test data sufficiently in advance of construction so as not to delay work. Furnish a drawing showing test locations, test numbers, and elevations. Submit test results within 3 days of test date. Field density tests shall be performed for subgrade excavation.
- D. Test for Moisture-Density Relations: Submit test results for each material at least 7 days prior to compacting of each material.
- E. Testing and Reporting: The Contractor shall verify testing and reporting requirements with the Contracting Officer prior to the start of earthwork operations.

1.04 SUBMITTALS

- A. Submit in accordance with Section 01330 Submittal Procedures.
- B. Test Reports: Submit test reports as directed by the Contracting Officer. Contractor shall verify all requirements prior to the start of earthwork operations.
- C. Certification of Compaction: An independent geotechnical testing laboratory shall test and certify all compaction work. Certifications and test results shall be submitted to the Contracting Officer within three (3) days of the test.
- D. Field Dry Density and Moisture Content Tests: Submit field test data not listed above sufficiently in advance of construction so as not to delay work. Furnish a drawing showing test locations, test numbers, and elevations. Submit test results within 3 days of test date.
- E. Manufacturer's product literature: Submit manufacturer's product literature including description of material and physical properties and laboratory test data for bedding material, sub-bedding material, general fill, and structural fill to the Contracting Officer for approval at least 15 calendar days prior to construction.

1.05 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor shall be responsible for the protection of existing surface and subsurface utilities and poles within and abutting the project site. Utilities shown on drawings are based on available as-built drawings. Contractor shall tone for existing underground utilities wherever excavation work is to be done and notify Contracting Officer immediately if uncharted or incorrectly charted utilities are found.
- B. The Contractor shall retain and pay for the services of a Geotechnical Engineer to monitor and perform testing during the earthwork operations and prepare and sign the final Grading Report. The Geotechnical Engineer shall be a licensed Civil Engineer licensed in the state of Hawaii specializing in geotechnical engineering with at least 5 years of licensed experience.
- C. The Contractor shall notify the Contracting Officer at least 7 days prior to conducting any excavation or compaction activity.
- D. All clearing, site preparation or earthwork performed on the project up to the approximate subgrades shall be conducted by the Contractor under the inspection of its Geotechnical Engineer.
- E. It is the Contractor's responsibility to prepare the ground surface to receive the fills and to place, spread, mix, moisture condition, and compact the fill in accordance with the Specifications herein. The Contractor shall also remove all unsuitable and deleterious materials.
- F. It is also the Contractor's responsibility to have suitable and sufficient compaction equipment on the job site to handle the amount of fill being placed. If necessary, excavation equipment shall be shut down to allow completion of compaction. Sufficient watering apparatus will also be provided by the Contractor with due consideration for the fill material, rate of placement, and the time of year.
- G. The Contractor shall not implement blasting as a means for removal of material.

- H. The Geotechnical Engineer shall promptly notify both the Contractor and the Contracting Officer verbally of any failing compaction tests and the results of such tests to the extent the tests show a lack of compliance with these Specifications. These items shall also be documented by the Geotechnical Engineer.
- I. If field density tests indicate inadequate compaction or moisture content, the Contractor shall moisture condition, recompact and retest until adequate compaction and adequate moisture content is achieved.
- J. During construction, drainage shall be provided to minimize ponding of water adjacent to or on pavement areas. Ponded areas shall be drained immediately. Any subgrade soil that has become soft due to ponding shall be removed to firm material and replaced with compacted structural fill at no cost to the State.
- K. It shall be the Contractor's responsibility to conform to all OSHA safety standards for excavations.
- L. It shall be the Contractor's responsibility to conduct and pay for all testing and prepare testing reports and data as required within this specification.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. General: Refer to the aforementioned DOT Standard Specifications for materials not listed below.
- B. Aggregate Base Course and Aggregate Subbase Course shall consist of crushed basaltic aggregates and shall meet the minimum requirements of Sections 703.06 and 703.17, respectively of the DOT Standard Specifications.
- C. Onsite soils may be reused as general fill provided that they are free of vegetation, deleterious materials, and rock fragments greater than 3 inches in maximum dimension.
- D. Structural fill shall consist of well graded, non-expansive granular material such as crushed coral or basalt. It shall be free of organics, vegetation, and debris and shall be well-graded from coarse to fine with particles no larger than 3 inches in dimension. The material shall have a California Bearing Ratio (CBR) value of 20 or higher and a swell potential of 1 percent or less when tested in accordance with ASTM D1883. The material shall also contain between 10 and 30 percent of soil by weight passing a U.S. No. 200 standard sieve.

PART 3 – EXECUTION

3.01 PREPARATION

- A. Erosion and sediment controls measure shall be installed as indicated on the construction documents and in Section 02370 Sediment and Erosion Control prior to any ground disturbing activities.

- B. All earthwork shall be performed in strict accordance with applicable law, including local ordinances, and applicable OSHA requirements. All excavations shall be protected and guarded against danger to life, limb, and property.

3.02 EXCAVATION

- A. Excavate to contours and dimensions and depths indicated. Keep excavations free from water while construction is in progress. Notify the Contracting Officer immediately in writing in the event that it becomes necessary to remove material to a depth greater than indicated. Refill excavations cut below the depths indicated with native soil material. Excavate soil disturbed or weakened by construction operations or soils softened from exposure to weather at no cost to the State. Refill with structural fill and compact as specified herein.
- B. Unauthorized excavations carried below specified levels shall be filled with concrete or structural fill to the proper level as directed by the Contracting Officer at the Contractor's expense
- C. Dispose of excess excavated soil material and materials not acceptable for use as backfill and fill.

3.03 PLACEMENT OF FILL UNDER PAVEMENTS AND WALKWAYS

- A. All fill material shall be placed in accordance with the DPW Standard Specifications unless otherwise noted in this Specifications.
- B. In areas requiring fill placement, the exposed subgrade shall be scarified to a minimum depth of 10 inches, moisture conditioned to about 2 percent above the optimum moisture content, and recompacted to at 95 percent relative compaction as determined by ASTM D 1557.
- C. All soft and yielding soil encountered at the subgrade shall be removed to expose the underlying firm or dense materials. Over excavation shall be backfilled with well-compacted general fill placed in 6 to 8-inch loose lifts and compacted.
- D. Encountered voids shall be filled with general fill placed in 6 to 8-inch loose lifts to provide a firm bottom.
- E. Do not place fill material on muddy or saturated surfaces.
- F. Subbase course and base course shall be placed in horizontal lifts restricted to 8 inches in loose thickness.

3.04 PLACEMENT OF GENERAL FILL

- A. All fill material shall be placed in accordance with the DPW Standard Specifications unless otherwise noted in this Specification.
- B. In areas requiring fill placement, the exposed subgrade shall be scarified to a minimum depth of 10 inches, moisture conditioned to about 2 percent above the optimum moisture content, and recompacted between 90 and 95 percent compaction as determined by ASTM D 1557.
- C. Place general fill in lifts not exceeding 8 inches in loose thickness.

- D. Fill placed in areas which slope steeper than 5H:1V should be continually benched as the fill is brought up in lifts. Filling the slope with sliver fills should be avoided.

3.05 COMPACTION

- A. Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same soil established in accordance with ASTM D 1557 test procedures. Optimum moisture is the water content (percentage by dry weight) corresponding to the maximum dry density.
- B. Each layer of fill and backfill shall be thoroughly compacted from edge to edge using conventional compaction equipment.
- C. Subgrade shall be moisture conditioned to about 2 percent above optimum moisture content and compacted between 90 and 95 percent compaction. Subgrade soils shall be moistened and kept moist until covered by the pavement structural section.
- D. Subbase and base course placed beneath pavements and walkways shall be moisture conditioned to about 2 percent above optimum moisture content and compacted to a minimum of 95 percent compaction.
- E. Proof-Rolling
 - a. Proof-rolling shall be implemented by use of a pneumatic-tired vehicle with a gross vehicle weight of at least 30,000 pounds. The equipment used for proof-rolling shall be operated at a speed of about 300 feet per minute and make at least two passes over the entire area.
 - b. Pavement subgrades shall be proof-rolled prior to placing of aggregate base or subbase course materials.
 - c. Proof-rolling shall also be performed on each lift of aggregate base and subbase course materials.
 - d. Areas with excessive rutting and/or pumping shall be over-excavated to expose firm material, and the resulting excavation shall be backfilled with well-compacted aggregate base course material.
- F. General fill shall be compacted to a minimum 90 percent compaction as determined by ASTM D 1557.

3.06 GRADING CONTROL

- A. Observation of the fill placement shall be provided by the Geotechnical Engineer during the progress of grading.
- B. Perform density tests in randomly selected locations using ASTM D 1556 or ASTM D 6938 as follows: one test per 100 square feet or fraction thereof for subgrade and in each layer of fill under structure, but not less than one test per lift. Determine moisture content of soil material in place at every location where in-place density is tested.
- C. Density tests shall also be made on the surface material to receive fill and cut areas as required by the Geotechnical Engineer.

- D. Where failing density tests occur, the Contractor and Contracting Officer shall be verbally notified of such conditions followed by written communication from the Geotechnical Engineer.

3.07 FINISHING

- A. The finished surface shall be true to grade and elevation and shall provide a firm base. Tolerances shall be 0.10 feet.

3.08 STORAGE AND DISPOSAL OF EXCAVATED MATERIALS

- A. Stockpile satisfactory excavated materials as directed by the Contracting Officer, until required for backfill and fill. The Contractor shall provide temporary BMP measures in accordance with City, State, and Federal regulations and these specifications.
- B. Dispose of excess excavated soil material and materials not acceptable for use as backfill or fill in accordance with City, State, and Federal regulations.
- C. Landfill Disposal or Recycling Manifest: Submit certified disposal and recycling manifest documenting proper transit and disposal of demolition materials. Receipt of certified manifests shall be requirement prior to progress payment for disposal or recycling. Submit manifests with the Contractor Daily Progress Report.

3.09 UNFORESEEN CONDITIONS

- A. Unforeseen soil conditions such as massive rock, abandoned utilities, abandoned structure foundations, large voids or large cavities, massive boulders, etc. shall receive corrective measures made in the field as they are detected by the Contracting Officer.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

- A. All work specified in this section shall not be measured nor paid for separately but shall be considered incidental to Bid Item No. 3 – Repair – Fuel Station Pavement, of the Proposal and Proposal Schedule.

END OF SECTION

SECTION 02370 – SEDIMENT AND EROSION CONTROL

PART 1 – GENERAL

1.01 SUMMARY

A. Section Includes:

1. Furnishing detailed plans, diagrams, and written Site-Specific Best Management Practices (BMP); constructing, maintaining, and repairing temporary water pollution, dust, and erosion control measures at the project site, including local material sources, work areas and haul roads; removing and disposing hazardous wastes; control of fugitive dust (defined as uncontrolled emission of solid airborne particulate matter from any source other than combustion); and complying with applicable State and Federal permit conditions..
2. Work associated with construction stormwater, dewatering, and hydrotesting activities and complying with conditions of the National Pollutant Discharge Elimination System (NPDES) permit(s) authorizing discharges associated with construction stormwater, dewatering, and hydrotesting activities.
3. Potential pollutant identification and mitigation measures are listed in Appendix A for use in the development of the Contractor’s Site-Specific BMP.
4. Requirements of this section also apply to construction support activities including concrete or asphalt batch plants, rock crushing plants, equipment staging yards/areas, material storage areas, excavated material disposal areas, and borrow areas located outside the State Right-of-Way.
5. The Contractor shall be responsible for securing the necessary permits, clearances, and documents, and following the conditions of the permits and clearances, at no cost to the State.

B. Related Sections include the following:

1. DIVISION 1 – GENERAL REQUIREMENTS for restrictions on use of the premises and Owner-occupancy requirements.
2. Section 01567 - Environmental Protection.
3. Section 02070 – Selective Demolition.
4. Section 02100 - Site Preparation.
5. Section 02200 - Earthwork.

1.02 REFERENCES

- A. Hawaii Administrative Rules, Title 11, Department of Health, Chapter 54, “Water Quality Standards” and Chapter 55 “Water Pollution Control”.
- B. The “2005 Standard Specifications for Road and Bridge Construction”, State of Hawaii, Department of Transportation, hereafter referred to as the “DOT Standard Specifications.” (Paragraphs concerning Measurement and Payment are not applicable to this project.)

- C. "Construction Best Management Practices Field Manual", State of Hawaii, Department of Transportation, Highways Division, hereafter referred to as the HDOT "Construction Best Management Practices Field Manual", dated January 2008.
- D. Maui County Code 20.08 - Soil Erosion and Sediment Control.

1.03 SUBMITTALS

- A. Submit in accordance with Section 01300 Submittal Procedures.
- B. Site-Specific BMP Plan within 21 calendar days of date of award. Submission of complete and acceptable Site-Specific BMP Plan is the sole responsibility of the Contractor and additional contract time will not be issued for delays due to incompleteness.
- C. Solid Waste Disclosure Form for Construction Sites within 21 calendar days of date of award.
- D. Manufacturer's product literature: Submit manufacturer's product literature including description of material, physical properties and Safety Data Sheets.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Comply with materials described in Chapter 2 and 3 of the HDOT "Construction Best Management Practices Field Manual".
- B. All sediment and erosion control measures shall comply with the State Department of Health regulations.
- C. Drain Inlet Filter shall be a sewn geotextile fabric unit fitted to the individual grates and completely enclosing the grates. It shall have lifting devices to allow manual inspection of the storm drain system. The fabric of the protection device shall have the following characteristics:

Fabric Property	Test Method	Units	Value
Grab Tensile Strength	ASTM D4632	lb	450 x 300
Grab Tensile Elongation	ASTM D4632	%	40 x 25
Puncture Strength	ASTM D4833	lb	130
Mullen Burst Strength	ASTM D3786	psi	600
Trapezoid Tear Strength	ASTM D4533	lb	165 x 150
Apparent Opening Size (AOS)	ASTM D4751	US Sieve	30
Permittivity	ASTM D4491	sec ⁻¹	3.5
Permeability	ASTM D4491	cm/sec	0.25
Flow Rate	ASTM D4491	gal/min/ft ²	250
UV Resistance (at 500 hours)	ASTM D4355	% strength retained	70

- D. Catch basin filter shall be a sewn fabric unit enclosing a porous structure in the form of a cylindrical tube placed in front of and extending beyond the inlet opening on both sides. It shall also have a pouch on the street side of the sewer unit for aggregate or other material to hold the unit in place. The fabric of the protection device shall have the following characteristics:

Fabric Property	Test Method	Units	Value
Grab Tensile Strength	ASTM D4632	lb	450 x 300
Grab Tensile Elongation	ASTM D4632	%	40 x 25
Trapezoid Tear Strength	ASTM D4533	lb	165 x 150
Puncture Strength	ASTM D4833	lb	130
Mullen Burst Strength	ASTM D3786	psi	600
Apparent Opening Size (AOS)	ASTM D4751	US Sieve	30
Permittivity	ASTM D4491	sec ⁻¹	3.5
Permeability	ASTM D4491	cm/sec	0.25
Flow Rate	ASTM D4491	gal/min/ft ²	250
UV Resistance (at 500 hours)	ASTM D4355	% strength retained	70

PART 3 – EXECUTION

3.01 PRECONSTRUCTION REQUIREMENTS

- A. Water Pollution, Dust, and Erosion Control Meeting. Schedule a water pollution, dust, and erosion control meeting with the Engineer after Site-Specific BMP is accepted in writing by the Engineer. Meeting shall be scheduled a minimum of 7 calendar days prior to the Start Work Date. Discuss sequence of work, plans and proposals for water pollution, dust, and erosion control.
- B. Site-Specific BMP Plan shall be submitted and approved prior to start of any ground disturbing activities. It shall include:
1. Written description of activities to minimize water pollution and soil erosion into State waters, drainage or sewer systems. BMP shall include the following:
 - a. An identification of potential pollutants and their sources.
 - b. A list of all materials and heavy equipment to be used during construction.
 - c. Descriptions of the methods and devices used to minimize the discharge of pollutants into State waters, drainage or sewer systems.
 - d. Details of the procedures used for the maintenance and subsequent removal of any erosion or siltation control devices.
 - e. Methods of removing and disposing hazardous wastes encountered or generated during construction.
 - f. Methods of removing and disposing concrete and asphalt pavement cutting slurry, concrete curing water, and hydrodemolition water.

- g. Spill Control and Prevention and Emergency Spill Response Plan.
 - h. Fugitive dust control, including dust from grinding, sweeping, or brooming off operations or combination thereof.
 - i. Methods of storing and handling of oils, paints and other products used for the project.
 - j. Material storage and handling areas, and other staging areas.
 - k. Concrete truck washouts.
 - l. Concrete waste control.
 - m. Fueling and maintenance of vehicles and other equipment.
 - n. Tracking of sediment offsite from project entries and exits.
 - o. Litter management.
 - p. Toilet facilities.
 - q. Other factors that may cause water pollution, dust and erosion control.
2. Provide plans indicating location of water pollution, dust and erosion control devices; provide plans and details of BMPs to be installed or utilized; show areas of soil disturbance in cut and fill, indicate areas used for construction staging and storage including items (a) through (q) above, storage of aggregate (indicate type of aggregate), asphalt cold mix, soil or solid waste, equipment and vehicle parking, and show areas where vegetative practices are to be implemented. Indicate intended drainage pattern on plans. Include flow arrows. Include separate drawing for each phase of construction that alters drainage patterns. Indicate approximate date when device will be installed and removed.
 3. Construction schedule.
 4. Name(s) of specific individual(s) designated responsible for water pollution, dust, and erosion controls on the project site. Include home, cellular, and business telephone numbers, fax numbers, and e-mail addresses.
 5. Description of fill material to be used.
 6. Site-Specific BMP Review Checklist. The checklist may be downloaded from HDOT's Stormwater Management website at <http://stormwaterhawaii.com>.
 - a. Date and sign Site-Specific BMP Plan. Keep accepted copy on site or at an accessible location so that it can be made available at the time of an on-site inspection or upon request by the Engineer, HDOT Third-Party Inspector, and/or DOH/EPA Representative. Amendments to the Site-Specific BMP Plan shall be included with original Site-Specific BMP Plan. Modify SWPPP if necessary to conform to revisions. Include date of installation and removal of Site-Specific BMP measures. Obtain written acceptance by the Engineer before implementing revised Site-Specific BMPs in the field.

- b. Follow the guidelines in the current HDOT “Construction Best Management Practices Field Manual”, in developing, installing, and maintaining Site-Specific BMPs for all projects. For any conflicting requirements between the Manual and applicable bid documents, the applicable bid documents will govern. Should a requirement not be clearly described within the applicable bid documents, notify the Engineer immediately for interpretation. For the purposes of clarification “applicable bid documents” include the construction plans, DOT Standard Specifications, special provisions, Permits, and the SWPPP when applicable.

3.01 INSTALLATION

- A. Install, maintain, monitor, repair and replace site-specific BMP measures, such as for water pollution, dust and erosion control; installation, monitoring, and operation of hydrotesting activities; removal and disposal of hazardous waste indicated on plans, concrete cutting slurry, concrete curing water; or hydro-demolition water. Site-Specific BMP measures shall be in place, functional and accepted by HDOT personnel prior to initiating any ground disturbing activities.
- B. Install temporary berms, cut-off ditches and other provisions needed for construction methods and operations.
- C. Catch Basin and Drain Inlet Protection
 - 1. Protection devices shall be installed per manufacturer’s instructions at all storm drain inlets and catch basins as indicated on the plans to prevent any sediment laden runoff from leaving the site.
 - 2. Catch basin and inlet protection devices shall be removed during periods of above normal rainfall and replaced after the event has passed.
- D. Erosion and sediment control measures shall be adjusted as directed by the Contracting Officer at no additional cost to the State.

3.02 DUST CONTROL

- A. Prevent dust from becoming airborne at all times including non-working hours, weekends and holidays in conformance with the State Department of Health, Administrative Rules, Title 11, Chapter 60.1 - Air Pollution Control.
- B. For the duration of the contract, in areas subject to surface and air movement of dust, where on-site or off-site damage is likely to occur, one or more of the following preventive measures shall be taken for dust control:
 - 1. Minimize the period of soil exposure through the use of temporary ground cover, environmentally friendly chemicals, or other temporary stabilization practices.
 - 2. Sprinkle the site with water until surface is wet. Repeat as needed.
- C. Contractor is responsible for all damage claims due to their negligence to control dust.

3.03 MAINTENANCE

- A. Sediment control measures shall be inspected immediately after each rainfall and at least daily during prolonged rainfall.
- B. Sediment control measures shall be inspected for depth of sediment, tears, and to see if the device is securely anchored. Any deficiencies shall be repaired immediately.

- C. Should any portion of the sediment control measures decompose or become ineffective prior to the end of the expected usable life and the measure is still necessary, the ineffective measure or portion of measure shall be replaced promptly at no additional cost to the State.
- D. Immediately initiate stabilizing exposed soil areas upon completion of earth disturbing activities for areas permanently or temporarily ceased on any portion of the site. Earth-disturbing activities have permanently ceased when clearing and excavation within any area of the construction site that will not include permanent structures has been completed. Earth-disturbing activities have temporarily ceased when clearing, grading, and excavation within any area of the site that will not include permanent structures will not resume for a period of 14 or more calendar days, but such activities will resume in the future. The term “immediately” is used in this section to define the deadline for initiating stabilization measures. “Immediately” means as soon as practicable, but no later than the end of the next work day, following the day when the earth-disturbing activities have temporarily or permanently ceased.
- E. Any sediment deposits remaining in place after the barrier is no longer required shall be graded to conform to the existing grade, prepared, and seeded.
- F. Upon completion of the project the Contractor shall remove all sediment control measures from the site.
- G. Upon completion of the project, existing drain inlets, catch basins, and drainageways adjacent to the project shall be inspected. Any accumulated sediment and debris found in the drain inlet, catch basin, or drainageway shall be removed and disposed of properly. Flushing into the drainage system is prohibited.

3.04 CONFORMANCE

- A. Maintain records of inspections of Site-Specific BMP work. Keep continuous records for duration of the project. Submit copy of Inspection Report to the Engineer within 24 hours after each inspection.
- B. Failure to conform to the above requirement and regulations will be cause for temporary or permanent suspension of operations. If operations are suspended due to the Contractor’s failure to conform, the Contractor shall maintain the project during the period of suspension at no cost to the State.
- C. Contractor shall also be subject to Liquidated Damages as delineated in the plans on Civil Notes sheet under “Water Pollution and Erosion Control Notes” paragraph A.3.
- D. The Contractor’s designated representative specified in Subsection 3.01 B.4 shall address any Site-Specific BMP deficiencies brought up by the Engineer immediately, including weekends and holidays, and complete work to fix the deficiencies by the close of the next work day if the problem does not require significant repair or replacement, or if the problem can be corrected through routine maintenance. Address any Site-Specific BMP deficiencies brought up by the State’s Third-Party Inspector in the timeframe above or as specified in the Consent Decree or MS4 NPDES Permit, whichever is more stringent. The Consent Decree timeframe requirement applies statewide. The MS4 NPDES Permit only applies to Oahu. In this section, “immediately” means the Contractor shall take all reasonable measures to minimize or prevent discharge of pollutants until a permanent solution is installed and made operational. If a problem is

identified at a time in the day in which it is too late to initiate repair, initiation of repair shall begin on the following work day. When installation of a new pollution prevention control or a significant repair is needed, complete installation or repair no later than 7 calendar days from the time of notification/Contractor discovery. Notify the Engineer and document why it is infeasible to complete the installation or repair within 7 calendar days and complete the work as soon as practicable and as agreed to by the Engineer. Address Site-Specific BMP deficiencies discovered by the Contractor within the timeframe above. If the Contractor fails to satisfactorily address these Site-Specific BMP deficiencies, the Engineer reserves the right to employ outside assistance or use the Engineer's own labor forces to provide necessary corrective measures. The Engineer will charge the Contractor such incurred costs plus any associated project engineering costs. The Engineer will make appropriate deductions from the Contractor's monthly progress estimate. Failure to apply Site-Specific BMP measures may result in one or more of the following: assessment of liquidated damages, suspension, or cancellation of Contract with the Contractor being fully responsible for all additional costs incurred by the State.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

- A. All work specified in this section shall not be measured nor paid for separately but shall be considered incidental to Bid Item No. 6 – Environmental, of the Proposal and Proposal Schedule. No progress payment will be authorized until the Engineer accepts in writing Site-Specific BMP or when the Contractor fails to maintain project site in accordance with accepted BMP.
- B. For all citations or fines received by the Department for non-compliance, the Contractor shall reimburse State within 30 calendar days for full amount of outstanding cost State has incurred, or the Engineer will deduct cost from progress payment.
- C. The Engineer will assess liquidated damages up to \$27,500 per day for non-compliance of each BMP requirement and all other requirements in this section

Appendix A

The following list identifies potential pollutant sources and corresponding BMPs used to mitigate the pollutants. Each BMP is referenced to the corresponding section of the current HDOT Construction Best Management Practices Field Manual. The Manual may be obtained from the HDOT Statewide Stormwater Management Program Website at <http://www.stormwaterhawaii.com/resources/contractors-and-consultants/> under Construction Best Management Practices Field Manual.

Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
<p><i>Construction debris, green waste, general litter</i></p>	<ul style="list-style-type: none"> • <i>Separate contaminated clean up materials from construction and demolition (C&D) wastes.</i> • <i>Provide waste containers (e.g., dumpster or trash receptacle) of sufficient size and number to contain construction and domestic wastes.</i> • <i>Inspect construction waste and recycling areas regularly.</i> • <i>Schedule solid waste collection regularly.</i> • <i>Schedule recycling activities based on construction/demolition phases.</i> • <i>Empty waste containers weekly or when they are two-thirds full, whichever is sooner.</i> • <i>Do not allow containers to overflow. Clean up immediately if they do.</i> • <i>On work days, clean up and dispose of waste in designated waste containers.</i> • <i>See Solid Waste Management Section SM-6 for additional requirements.</i> • <i>Provide Storm Drain Inlet Protection and/or Perimeter Sediment Controls as applicable.</i> • <i>Collect and dispose of all waste materials in trash dumpsters. Place dumpsters, with secure watertight lids, away from storm water conveyances and drains, in a covered materials storage area.</i> • <i>Dispose of construction and non- construction solid waste in accordance with State DOH regs.</i> • <i>Load removed non- recyclable vegetation directly onto trucks; cover and transport to a licensed facility</i> 	<p><i>See Solid Waste Management Section SM-6. Storm Drain Inlet Protection SC-1, and Perimeter Sediment Controls where applicable.</i></p>
<p><i>Soil erosion from the disturbed areas</i></p>	<ul style="list-style-type: none"> • <i>For Storm Drain Inlet Protection, clean, or remove and replace, the protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised.</i> • <i>Where there is evidence of sediment accumulation adjacent to the inlet protection measure, remove the deposited sediment by the end of the same day in which it is found or by the end of the following work day if removal by the same day is not feasible.</i> 	<p><i>Non-Structural BMPs</i></p> <ol style="list-style-type: none"> <i>1. SM-1 Construction BMP Training</i> <i>2. SM-14 Scheduling</i> <i>3. SM-15 Location of Potential Sources of Sediment</i>

Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
<p><i>Materials associated with the operation and maintenance of equipment, such as oil, fuel, and hydraulic fluid leakage</i></p>	<ul style="list-style-type: none"> • <i>Use off-site wash racks, repair and maintenance facilities, and fueling sites when practical.</i> • <i>Designate bermed wash area if cleaning on site is necessary.</i> • <i>Place drip pans or drop cloths under vehicles and equipment to absorb spills or leaks.</i> • <i>Provide an ample supply of readily available spill cleanup materials.</i> • <i>Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly.</i> • <i>Do not clean surfaces or spills by hosing the area down.</i> • <i>Eliminate the source of the spill to prevent a discharge or a continuation of an ongoing discharge.</i> • <i>Inspect on-site vehicles and equipment regularly and immediately repair leaks.</i> • <i>Regularly inspect fueling areas and storage tanks.</i> • <i>Train employees on proper maintenance and spill practices and procedures and fueling and cleanup procedures.</i> • <i>Store diesel fuel, oil, hydraulic fluid, or other petroleum products or other chemicals in water-tight containers and provide cover or secondary containment.</i> • <i>Do not remove original product labels and comply with manufacturer's labels for proper disposal.</i> • <i>Dispose of containers only after all the product has been used.</i> • <i>Dispose of or recycle oil or oily wastes according to Federal, State, and Local requirements.</i> • <i>Store soaps, detergents, or solvents under cover or other means to prevent contact with rainwater.</i> • <i>See Vehicle and Equipment Cleaning, Maintenance, and Refueling, Sections SM-11, SM-12, and SM-13 and Material Storage and Handling Section SM-2 for additional requirements.</i> 	<p><i>See Vehicle and Equipment Cleaning, Maintenance, and Refueling, Sections SM-11, SM-12, and SM-13, and Material Storage and Handling, Section SM-2, and Spill Prevention and Control SM-10.</i></p>

Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
<i>Sediment from soil stockpiles</i>	<ul style="list-style-type: none"> • <i>Locate stockpiles a minimum of 50 feet or as far as practicable from concentrated runoff or outside of any natural buffers identified on the SWPPP.</i> • <i>Place bagged materials on pallets and under cover.</i> • <i>Provide physical diversion to protect stockpiles from concentrated runoff.</i> • <i>Cover stockpiles with plastic or comparable material when practicable.</i> • <i>Place silt fence, fiber filtration tubes, or straw wattles around stockpiles.</i> • <i>Do not hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any storm water conveyance (unless connected to a sediment basin, sediment trap, or similarly effective control), storm drain inlet, or state water.</i> • <i>Unless infeasible, contain and securely protect stockpiles from the wind.</i> • <i>Provide Storm Drain Inlet Protection and/or Perimeter Sediment Controls as applicable.</i> <p><i>See Stockpile Management Section SM-3 for additional requirements.</i></p>	<p><i>See Stockpile Management Section SM-3. Storm Drain Inlet Protection SC-1, and Perimeter Sediment Controls where applicable.</i></p>
<i>Emulsified asphalt or prime/tack coat</i>	<ul style="list-style-type: none"> • <i>Provide training for employees and contractors on proper material delivery and storage practices and procedures.</i> • <i>Restrict paving operations during wet weather to prevent paving materials from being discharged.</i> • <i>Use asphalt emulsions such as prime coat when possible.</i> • <i>Protect drain inlet structures and manholes during application of tack coat, seal coat, slurry seal, and fog seal.</i> • <i>Keep ample supplies of drip pans and absorbent materials on site.</i> • <i>Inspect inlet protection devices.</i> • <i>See Material Storage and Handling Section SM-2 and Paving Operations Section SM-20 for additional requirements.</i> • <i>Provide Storm Drain Inlet Protection and/or Perimeter Sediment Controls as applicable.</i> 	<p><i>See Material Storage and Handling Section SM-2, and Stockpile Management Section SM-3, Paving Operations Section SM-20, Storm Drain Inlet Protection SC-1, and Perimeter Sediment Controls where applicable.</i></p>

Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
<p><i>Materials associated with painting, such as paint and paint wash solvent</i></p>	<ul style="list-style-type: none"> • <i>Hazardous chemicals shall be well-labeled and stored in original containers.</i> • <i>Keep ample supply of cleanup materials on site.</i> • <i>Dispose container only after all of the product has been used.</i> • <i>Remove as much paint from brushes on painted surface.</i> • <i>Rinse from water-based paints shall be discharged into the sanitary sewer system where possible. If not, direct all washwater into a leak-proof container or leak-proof pit. The container or pit must be designed so that no overflows can occur due to inadequate sizing or precipitation.</i> • <i>Locate on-site wash area a minimum of 50 feet away or as far as practicable from storm drain inlets, open drainage facilities, or water bodies.</i> • <i>Do not dump liquid wastes into the storm drainage system.</i> • <i>Filter and re-use solvents and thinners.</i> • <i>Dispose of oil-based paints and residue as a hazardous waste.</i> • <i>Ensure collection, removal, and disposal of hazardous waste complies with regulations.</i> • <i>Immediately clean up spills and leaks.</i> • <i>Properly store paints, solvents, and epoxy compounds.</i> • <i>Properly store and dispose waste materials generated from painting and structure repair and construction activities.</i> • <i>Mix paints in a covered and contained area, when possible, to minimize adverse impacts from spills.</i> • <i>Do not apply traffic paint or thermoplastic if rain is forecasted.</i> • <i>See Material Storage and Handling Use SM-2, Hazardous Materials and Waste Management Section SM-9, Spill Prevention and Control Section SM-10, and Structure Construction and Painting Section SM-21 for additional requirements. Provide Storm Drain Inlet Protection and/or Perimeter Sediment Controls as applicable.</i> 	<p><i>See Material Storage and Handling Use Section SM-2, Stockpile Management Section SM-3, Hazardous Materials and Waste Management Section SM-9, Waste Management, Spill Prevention and Control Section SM-10, and Structure Construction and Painting Section SM-21, Storm Drain Inlet Protection SC-1, and Perimeter Sediment Controls where applicable.</i></p>

Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
<p><i>Industrial chemicals, fertilizers, and/or pesticides</i></p>	<ul style="list-style-type: none"> • <i>Hazardous chemicals shall be well-labeled and stored in original containers.</i> • <i>Keep ample supply of cleanup materials on site.</i> • <i>Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly.</i> • <i>Do not clean surfaces or spills by hosing the area down.</i> • <i>Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge.</i> • <i>Dispose container only after all of the product has been used.</i> • <i>Retain a complete set of safety data sheets (formerly MSDS) on site.</i> • <i>Store industrial chemicals in water-tight containers and provide either cover or secondary containment.</i> • <i>Provide cover when storing fertilizers or pesticides to prevent these chemicals from coming into contact with rainwater.</i> • <i>Restrict amount of pesticide prepared to quantity necessary for the current application.</i> • <i>Do not apply fertilizers or pesticides during or just before a rain event.</i> • <i>Do not apply to stormwater conveyance channels with flowing water.</i> • <i>Comply with fertilizer and pesticide manufacturer's recommended usage and disposal instructions. Document departures from manufacturer's specifications in Attachment J.</i> • <i>Apply fertilizers at the appropriate time of year for the location, and preferably timed to coincide as closely as possible to the period of maximum vegetation uptake and growth.</i> • <i>Follow federal, state, and local laws regarding fertilizer application.</i> • <i>Do not dispose of toxic liquid wastes (solvents, used oils, and paints) or chemicals (additives, acids, and curing compounds) in dumpsters allocated for construction debris.</i> • <i>Ensure collection, removal, and disposal of hazardous waste complies with regulations. Hazardous waste that cannot be reused or recycled shall be disposed of by a licensed hazardous waste hauler.</i> • <i>See Material Storage and Handling Use SM-2, and Hazardous Materials and Waste Management Section SM-9 for additional requirements.</i> 	<p><i>See Material Storage and Handling Use Section SM-2, Stockpile Management Section SM-3, and Hazardous Materials and Waste Management Section SM-9, and Spill Prevention and Control SM-10</i></p>

Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
<p><i>Hazardous waste (Batteries, Solvents, Treated Lumber, etc.)</i></p>	<ul style="list-style-type: none"> • <i>Do not dispose of toxic materials in dumpsters allocated for construction debris.</i> • <i>Ensure collection, removal, and disposal of hazardous waste complies with regulations.</i> • <i>Hazardous waste that cannot be reused or recycled shall be disposed of by a licensed hazardous waste hauler.</i> • <i>Segregate and recycle wastes from vehicle/equipment maintenance activities such as used oil or oil filters, greases, cleaning solutions, antifreeze, automotive batteries, and hydraulic and transmission fluids.</i> • <i>Store waste in sealed containers, which are constructed of suitable materials to prevent leakage and corrosion, and which are labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements and all other applicable federal, state, and local requirements.</i> • <i>All containers stored outside shall be kept away from surface waters and within appropriately sized secondary containment (e.g., spill berms, decks, spill containment pallets). Provide cover if possible.</i> • <i>Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly.</i> • <i>Do not clean surfaces or spills by hosing the area down.</i> • <i>Eliminate the source of the spill to prevent a discharge or a continuation of an ongoing discharge.</i> • <i>Ensure collection, removal, and disposal of hazardous waste complies with manufacturer's recommendations and is in compliance with federal, state, and local requirements.</i> • <i>See Hazardous Materials and Waste Management Section SM-9 and Vehicle and Equipment Management, Vehicle and Equipment Maintenance SM-12 for additional requirements.</i> 	<p><i>See Hazardous Materials and Waste Management Section SM-9 and Vehicle and Equipment Maintenance SM-12</i></p>

Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
<i>Metals and Building Materials</i>	<ul style="list-style-type: none"> • <i>Inspect construction waste and recycling areas regularly.</i> • <i>Schedule solid waste collection regularly.</i> • <i>If building materials or metals are stored on site (such as rebar or galvanized poles) store under cover under tarps or in containers.</i> • <i>Minimize the amount of material stored on site.</i> • <i>Do not stockpile uncovered metals or other building materials in close proximity to discharge points.</i> • <i>See Solid Waste Management Section SM-6 for additional requirements.</i> 	<i>See Solid Waste Management Section SM-6</i>
<i>Contaminated Soil</i>	<ul style="list-style-type: none"> • <i>See Waste Management, Contaminated Soil Management Section SM-8 and/or Hazardous Materials and Waste Management Section SM-9 for additional requirements.</i> • <i>At minimum contain contaminated material soil by surrounding with impermeable lined berms or cover exposed contaminated material with plastic sheets.</i> 	<i>See Waste Management, Contaminated Soil Management Section SM-8 and/or Hazardous Materials and Waste Management Section SM-9</i>

Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
<i>Fugitive Dust Control and Dust Control Water</i>	<ul style="list-style-type: none"> • <i>Do not over spray water for dust control purposes which will result in runoff from the area.</i> • <i>Apply water as conditions require.</i> • <i>Washing down of debris or dirt into drainage, sewage systems, or State waters is not allowed.</i> • <i>Minimize exposed areas through the schedule of construction activities.</i> • <i>Utilize vegetation, mulching, sprinkling, and stone/gravel layering to quickly stabilize exposed soil.</i> • <i>Direct construction vehicle traffic to stabilized roadways.</i> • <i>Cover dump trucks hauling material from the site with a tarpaulin.</i> <p><i>See Dust Control Section SM-19 for additional requirements.</i></p>	<i>See Dust Control Section SM-19</i>
<i>Concrete Truck Wash Water</i>	<ul style="list-style-type: none"> • <i>Disposal of concrete truck wash water via percolation is prohibited.</i> • <i>Wash concrete-coated vehicles or equipment off-site or in the designated wash area.</i> • <i>Locate on-site wash area a minimum of 50 feet away or as far as practicable from storm drain inlets, open drainage facilities, or water bodies.</i> • <i>Runoff from the on-site concrete wash area shall be contained in a temporary pit or level bermed area where the concrete can set.</i> • <i>Design the area so that no overflow can occur due to inadequate wash area sizing or precipitation.</i> • <i>The temporary pit shall be lined with plastic to prevent seepage of wash water into the ground.</i> • <i>Allow wash water to evaporate or collect wash water and all concrete debris in a concrete washout system bin.</i> • <i>Do not dump liquid wastes into storm drainage system.</i> • <i>Dispose of liquid and solid concrete wastes in compliance with federal, state, and local standards.</i> • <i>See Waste Management, Concrete Wash and Waste Management Section SM-4 for additional requirements.</i> 	<i>See Waste Management, Concrete Wash and Waste Management Section SM-4</i>

Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
Sediment Track-Out	<ul style="list-style-type: none"> • <i>Include Stabilized Construction Entrance at all points that exit onto paved roads.</i> • <i>A sediment trapping device is required if a wash rack is used in conjunction with the stabilized construction entrance/exit.</i> • <i>The pavement shall not be cleaned by washing down the street.</i> • <i>If sweeping is ineffective or it is necessary to wash the streets, wash water must be contained either by construction of a sump, diverting the water to an acceptable disposal area, or vacuuming the wash water.</i> • <i>Use BMPs for adjacent drainage structures.</i> • <i>Remove sediment tracked onto the street by the end of the day in which the track-out occurs.</i> • <i>Restrict vehicle use to properly designated exit points.</i> • <i>Include additional BMPs that remove sediment prior to exit when minimum dimensions cannot be met.</i> <p><i>See Stabilized Construction Entrance/Exit Section SC-11 for additional requirements.</i></p>	See Stabilized Construction Entrance/Exit Section SC-11
Irrigation Water	<ul style="list-style-type: none"> • <i>Consider irrigation requirements.</i> • <i>Where possible, avoid species which require irrigation.</i> • <i>Design, timing and application methods of irrigation water to eliminate the runoff of excess irrigation water into the storm water drainage system.</i> <p><i>See Seeding and Planting Section EC-12 and California Stormwater BMP Handbook SD-12 Efficient Irrigation included in SWPPP Attachment A for additional requirements.</i></p>	See Seeding and Planting Section EC-12 and California Stormwater BMP Handbook SD-12 Efficient Irrigation
Hydrotesting Effluent	<ul style="list-style-type: none"> • <i>If work includes removing, relocation or installing waterlines, and Contractor elects to flush waterline or discharge hydrotesting effluent into State waters or drainage systems, the Contractor shall prepare and obtain HDOT acceptance of a NOI/NPDES Permit Form F application for HDOT submittal to DOH CWB at least 30 calendar days prior to the start of Hydrotesting Activities if necessary. Site specific BMPs will be included in the NOI/NPDES Permit Form F submittal.</i> 	Site specific BMPs will be included in the NOI/NPDES Permit Form F submittal.

Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
<i>Dewatering Effluent</i>	<i>If excavation or backfilling operations require dewatering, and Contractor elects to discharge dewatering effluent into State waters or existing drainage systems, Contractor shall prepare and obtain HDOT acceptance of a NOI/NPDES Permit Form G application for HDOT submittal to DOH CWB at least 30 calendar days prior to the start of Dewatering Activities if necessary. See Site Planning and General Practices, Dewatering Operations Section SM-18 for additional requirements.</i>	<i>See Dewatering Operations SM-18. Site specific BMPs will be included in the NOI/NPDES Permit Form G submittal.</i>
<i>Saw-cutting Slurry</i>	<ul style="list-style-type: none"> • <i>Saw cut slurry shall be removed from the site by vacuuming.</i> • <i>Provide storm drain protection during saw cutting. See Paving Operations Section SM-20 for additional requirements. Provide Storm Drain Inlet Protection and/or Perimeter Sediment Controls as applicable.</i> 	<i>See Paving Operations Section SM-20, Storm Drain Inlet Protection SC-1, Perimeter sediment controls where applicable</i>
<i>Concrete Curing Water</i>	<ul style="list-style-type: none"> • <i>Avoid overspraying of curing compounds.</i> • <i>Apply an amount of compound that covers the surface, but does not allow any runoff of the compound.</i> <i>See California Stormwater BMP Handbook NS-12 Concrete Curing included in SWPPP Attachment A for additional requirements.</i>	<i>See California Stormwater BMP Handbook NS-12 Concrete Curing</i>

Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
<i>Plaster Waste Water</i>	<ul style="list-style-type: none"> • <i>Direct all washwater into a leak-proof container or leak-proof pit. The container or pit must be designed so that no overflows can occur due to inadequate sizing or precipitation.</i> • <i>Locate on-site wash area a minimum of 50 feet away or as far as practicable from storm drain inlets, open drainage facilities, or water bodies.</i> • <i>Any significant residual materials remaining on the ground after the completion of construction shall be removed and properly disposed. If the residual materials contaminate the soil, then the contaminated soil shall also be removed and properly disposed of.</i> • <i>Plaster waste water shall not be allowed to flow into drainage structures or State waters. See Material, Storage and Handling Use SM-2, Stockpile Management Use Section SM-3, and Hazardous Materials and Waste Management Section SM-9 for additional requirements.</i> 	<i>See Material, Storage and Handling Use Section SM-2, Stockpile Management Use Section SM-3, and Hazardous Materials and Waste Management Section SM-9</i>
<i>Water-Jet Wash Water</i>	<ul style="list-style-type: none"> • <i>For Water-Jet Wash Water used to clean vehicles, use off site wash racks or commercial washing facilities when practical.</i> • <i>See Vehicle and Equipment Cleaning Section SM-11 for additional information.</i> • <i>For Water-Jet Wash Water used to clean impervious surfaces, the runoff shall not be allowed to flow into drainage structures or State Waters.</i> 	<i>See Vehicle and Equipment Cleaning Section SM-11</i>
<i>Sanitary/Septic Waste</i>	<ul style="list-style-type: none"> • <i>Locate Sanitary facilities in a convenient place away from drainage facilities.</i> • <i>Position sanitary facilities so they are secure and will not be tipped over or knocked down.</i> • <i>Wastewater shall not be discharged to the ground or buried.</i> • <i>A licensed service provider shall maintain sanitary/septic facilities in good working order.</i> • <i>Schedule regular waste collection by a licensed transporter.</i> • <i>See Sanitary Waste Section SM-7 for additional requirements.</i> 	<i>See Sanitary Waste Section SM-7.</i>

END OF SECTION

SECTION 02510 – ASPHALTIC CONCRETE PAVING

PART 1 - GENERAL

1.01 SUMMARY

- A. Furnish all labor, materials, equipment, and tools to cover the composition, mixing, and placement of asphalt concrete pavement.
- B. Related Sections include the following:
 - 1. Section 02200 – Earthwork.

1.02 REFERENCES

- A. The “Standard Specifications for Public Works Construction”, September 1986, of the Department of Public Works, including all revisions, as applicable to the County of Maui, hereafter referred to as the “DPW Standard Specifications”, or as herein specified. (Paragraphs concerning Measurement and Payment are not applicable to this project.)
- B. The “2005 Standard Specifications for Road and Bridge Construction”, State of Hawaii, Department of Transportation, hereafter referred to as the “DOT Standard Specifications.” (Paragraphs concerning Measurement and Payment are not applicable to this project.)

1.03 SUBMITTALS

- A. Submit in accordance with Section 01330 Submittal Procedures and Section 401 of the DOT Standard Specifications.
- B. Affidavits and data from the manufacturers or suppliers of all materials proposed to be furnished and installed under this section, certifying that such material delivered to the project conforms to the requirements of these specifications and provide the Material Product Data and Safety Data Sheets for the materials proposed for use for the Contracting Officer’s approval.
- C. Manufacturer’s product literature: Submit manufacturer’s product literature including description of material and physical properties and laboratory test data for aggregate material to the Contracting Officer for approval.
- D. Certificate of compliance for asphalt cement accompanied by substantiating test data.
- E. Reports for the control and acceptance testing.

1.04 COORDINATION

- A. Contractor shall coordinate the finish pavement and base preparation work with the Contracting Officer.
- B. Contractor shall maintain and provide safe pedestrian and vehicular access throughout the Project at all times as indicated in the construction documents unless authorized otherwise by the Contracting Officer.

PART 2 – PRODUCTS

2.01 MATERIALS

- A. Materials shall be in accordance with the appropriate sections of the DOT Standard Specifications unless otherwise noted.
- B. Asphalt Concrete shall be State Mix IV and conform to Section 401 Hot Mix Asphalt (HMA) Pavement of the DOT Standard Specifications.
- C. Tack coat shall be either SS1 or SS-1H emulsified asphalt conforming to the requirements under AASHTO M 140.
- D. Subbase and base courses for pavements shall conform to Section 02200 Earthwork.

PART 3 - EXECUTION

3.01 GENERAL

- A. Construct and test HMA Pavement in accordance with Section 401 of the DOT Standard Specifications and as required in this Section.

3.02 PREPARATION

- A. The Contractor shall stake out the areas to be paved, using grade stakes on which the final finish elevations and base course are clearly marked. All such stakes and elevations shall be approved by the Contracting Officer before any work is done.
- B. Areas with exposed base course material shall be tested to ensure a minimum of 95 percent compaction as determined by ASTM D1557. If the compaction is found to be less than the minimum 95 percent, the exposed area shall be recompacted as required.
- C. Install aggregate subbase and base courses in conformance with Section 02200 Earthwork.
- D. Apply tack coat in accordance with Section 407 of the DOT Standard Specifications.

3.03 INSTALLATION

- A. Deposit hot mix asphalt in a manner that minimizes segregation. Lay, spread, and strike off hot mix asphalt upon prepared surface.
- B. Finish height of asphalt shall be approximately 1/2 inch over the top of the pavement edging.
- C. In areas where irregularities or unavoidable obstacles make use of mechanical spreading and finishing equipment impracticable, spread, rake, and lute mixture by hand tools. For such areas, deposit, spread, and screed mixture to required compacted thickness.

3.04 FINISHING

- A. Smoothness. The finished surface of the pavement shall be true to grade and cross section, free from depressions and grainy spots, and of uniform texture. It shall not vary

more than 3/16 of an inch from any point along the bottom of a 10-foot straightedge laid in any direction except across the crown or swale.

- B. Finish pavement elevation shall not exceed 1/4 inch above the top of pavement edging.
- C. Surface Tolerance. Thickness of finished pavement shall be within 1/4 inch of thickness indicated in the contract documents. Correct pavement exceeding specified tolerances by methods accepted by the Contracting Officer, including removal and replacement, at no increase in contract price or contract time.
- D. Pavement shall be sloped to prevent ponding.

3.05 PAVEMENT SAMPLES AND TESTING

- A. At the discretion of the Contracting Officer, the Contractor shall obtain pavement samples and/or test the samples and restore the affected areas at no extra cost to the State.
 - 1. Size. The size of the samples shall be directed by the Contracting Officer. Core samples shall be minimum 4 inches in diameter. Cut samples shall be minimum 12 inches by 12 inches. Samples shall be taken to the full depth of the course.
 - 2. Location. As directed by the Contracting Officer but no more than three samples total.
 - 3. Testing. Samples shall be tested to determine thickness and density of the completed pavements. Cores and uncompacted samples will be used for the final determination of density.
 - 4. Restoration. Place and compact the sampled area with new materials to conform to the surrounding area.
 - 5. All data for the control and the acceptance testing shall be submitted to the Contracting Officer.

3.06 REPAIR OF EXISTING IMPROVEMENTS

- A. Any existing asphaltic concrete pavements that have been damaged by construction activities shall be repaired to the original condition and to the satisfaction of the Contracting Officer in accordance with DPW Standard Specification Section 38 - "Restoring Pavements and Other Improvements" at no cost to the State.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

- A. All work specified in this section shall not be measured nor paid for separately but shall be considered incidental to Bid Item No. 3 – Repair – Fuel Station Pavement, of the Proposal and Proposal Schedule.

END OF SECTION

SECTION 02580 – PAVEMENT MARKINGS AND SIGNAGE

PART 1 – GENERAL

1.01 SUMMARY

- A. Furnish all labor, materials and equipment necessary to install pavement markings, signs, sign posts and traffic bollards as indicated on the Plans and specified herein.
- B. Related Sections included the following:
 - 1. Section 03300 – Cast-in-Place Concrete.

1.02 REFERENCES

- A. The “2005 Standard Specifications for Road and Bridge Construction”, State of Hawaii, Department of Transportation, hereafter referred to as the “DOT Standard Specifications.” (Paragraphs concerning Measurement and Payment are not applicable to this project.)
- B. The “Standard Specifications for Public Works Construction”, September 1986, of the Department of Public Works, as applicable to the County of Maui, hereafter referred to as the “DPW Standard Specifications”, or as herein specified. (Paragraphs concerning Measurement and Payment are not applicable to this project.)

1.03 SUBMITTALS

- A. Submit in accordance with Section 01330 Submittal Procedures.
- B. Manufacturer's product data, Safety Data Sheet, and application instructions.
- C. Product Certificates: Certificates from manufacturers or suppliers to verify that types of materials being supplied meet the requirements of these Specifications.
- D. Shop drawings for new signs.

1.04 DELIVERY AND STORAGE

- A. Deliver paints and paint materials in original sealed containers that plainly show the designated name, specification number, batch number, color, date of manufacture, manufacturer's directions, and name of manufacturer.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Pavement Markings
 - 1. Materials shall be in accordance with the “DOT Standard Specifications” Section 755.01 for traffic paint, as revised.
 - 2. Pavement markings shall be colored as indicated on the drawings or as selected by the Contracting Officer.
 - 3. Paint shall be in sealed containers that plainly show the designated name, formula or specification number, batch number, color, date of manufacture, manufacturer's

formulation number and directions, and name of the manufacturer, all of which shall be plainly legible at the time of use. The paint shall be homogeneous, easily stirred to smooth consistency, and shall show no hard settlement or other objectionable characteristics.

B. Sign and Anchor Posts

1. **Material:** The sign and anchor posts shall be 12-gauge (0.105" U.S.S. Gauge) steel tube material conforming with ASTM designation A-446 Grade A for Cold-Rolled Carbon Steel Sheet commercial quality, ASTM designation A-570 for Hot-Rolled Carbon Steel Sheet commercial quality, or ASTM designation A787-94 for Hot-Rolled Carbon Steel structure.
2. **Size:** Sign posts shall be 2" x 2" square. The anchor post shall be a 2-1/4" x 2-1/4" square tube. Length of sign and anchor posts shall be in accordance with the Drawings.
3. **Perforation:** All sides shall have evenly spaced pre-drilled 7/16" diameter holes spaced 1" on-center on four sides along the length of the tube.
4. **Fabrication:** The sign and anchor posts shall be straight and shall have a smooth uniform finish. It shall be possible to telescope consecutive sizes of tubes freely with a minimum amount of play. All holes and cut off ends shall be free from burrs.
5. **Finish:** The sign and anchor posts shall be either hot dipped galvanized conforming to ASTM designation A-525 or triple coated by an in-line application of hot dipped galvanized zinc per AASHTO M-120 followed by a chromate conversion coating and a cross-linked polyurethane acrylic coating on the exterior with the inside surface given corrosion protection by an in-line application of a full zinc base organic coating testing in accordance with ASTM B-117.

C. Fastening Hardware: All fastening hardware shall be as specified in the Drawings.

D. Signs: Signs and sign finishings shall conform to requirements in Section 60 of the DPW Standard Specifications and in accordance with the Drawings.

E. Bollards: Bollards shall be 4-inch diameter Schedule 40 galvanized steel pipe filled with Class B concrete per Section 39 of the DPW Standard Specifications.

F. Reflective tape: High Intensity Prismatic (HIP) ASTM D4956 Type 4 weather-resistant tape. See plans for additional requirements.

G. Concrete Footing: Sign post and bollard concrete footing shall be Class B per Section 39 of the DPW Standard Specifications.

2.02 EQUIPMENT

A. All equipment, tools and machinery shall be suitable for pavement markings installation and shall be maintained in satisfactory operating condition at all times.

B. Paint Applicator: The equipment for applying paint to pavements shall be a self-propelled or mobile-drawn pneumatic spraying machine with suitable arrangements of atomizing nozzles and controls to obtain the specified results. The machine shall be

capable of applying the stripe widths indicated on the plans, shall have a speed during application of not less than five miles per hour, and shall be capable of applying the paint at the coverage rate specified hereinafter and at an even uniform thickness with clear-cut edges. The paint applicators shall have a paint reservoir of sufficient capacity and suitable gages to apply paint as specified herein. The reservoirs shall be equipped with suitable air-driven mechanical agitators. The spray mechanism shall be equipped with quick-action valves conveniently located, and shall include necessary pressure regulators and gages in full view and reach of the operator. Paint strainers shall be installed in the paint supply lines to ensure freedom from residue and foreign matter that may cause malfunction of the spray guns. The paint applicator shall be readily adaptable for attachment of an air-actuated dispenser for the reflective media. Pneumatic spray guns shall be provided for hand application of paint in areas where the mobile paint applicator cannot be used.

PART 3 - EXECUTION

3.01 GENERAL

- A. Pavement markings, signs, sign posts, anchor post, fastening hardware, bollards and concrete footing shall be installed as indicated on the plans.

3.02 SURFACE PREPARATION

- A. New asphalt concrete pavement shall be allowed to cure for a period of not less than seven days before the application of marking materials unless directed otherwise by the Contracting Officer.
- B. Concrete pavement or curbs shall be allowed to cure 72 hours before the application of marking materials unless directed by the Contracting Officer.
- C. Dust, clay, silt and sand shall be removed from the pavement to be marked before application of paint by sweeping, blowing with compressed air, rinsing with water or a combination of these methods as required. Rubber deposits, surface laitance and other substances adhering to the pavement shall be removed with stiff brooms, scrapers, wire brushes, sandblasting or mechanical abrasion.
- D. Paints shall not be applied when moisture or foreign matter is present on the pavement surface or when wind conditions are such as to cause dust to be deposited on the prepared areas or to prevent satisfactory application of the paint.
- E. Removal of Existing Pavement Markings: Prior to replacing pavement marking with new, existing pavement marking shall be completely covered with at least two coats of black traffic paint. No portion of existing markings shall be visible prior to receiving new markings in the same area. Black covering paint shall be allowed to completely dry per manufacturer's directions prior to application of new pavement markings.

3.03 CONTROL POINTS

- A. The Contractor shall establish control points and layout pavement markings. The layout shall be accepted by the Contracting Officer before installing the work.

3.04 TRAFFIC CONTROL

- A. The Contractor shall furnish, install and maintain suitable warning signs, barricades and other traffic control devices near work site to prevent damage to the newly painted surfaces.

3.05 PAINT APPLICATION

- A. Paint shall not be applied to damp or wet pavement surfaces or when inclement weather threatens to interrupt normal progress of the work.
- B. No painting shall be done during periods of high winds.
- C. Traffic paints shall not be applied when air and pavement temperatures exceed 95 degrees F.
- D. Paint shall be applied evenly to the pavement at a rate between 100 and 110 square feet per gallon. Apply two coats of paint.
- E. The Contractor shall provide guide lines and templates as necessary to control paint application. All edges of markings shall be sharply outlined. The width of the lines supplied shall be within a tolerance of 1/2-inch. The center line of marking will not deviate more than one-inch laterally from a straight line at any point.
- F. Workmanship shall conform to the best commercial practices consistent with these Specifications.
- G. Any spilled paints shall be cleaned from the paved areas to the satisfaction of the Contracting Officer.
- H. The Contractor shall keep the premises clean at all times. Paint, empty containers and other material or equipment will not be stored or allowed to accumulate on or near the paved areas.

3.06 INSPECTION AND ACCEPTANCE

- A. Pavement markings shall be subject to rigid inspection at all times and provisions of this specification will be strictly enforced.
- B. Painting shall not commence in any area until pavement surfaces have been inspected and the Contracting Officer approval is given to the Contractor to proceed.
- C. Areas found to be deficient in accordance with this specification shall be rejected and complete replacement or repainting will be required at no cost to the State.
- D. Signs shall be set level. Sign face shall be parallel or perpendicular to the edge of pavement as shown on the Drawings.
- E. Sign posts shall be plumb and secure within the anchor post. Sign posts, anchor posts and all fastening hardware shall not be deformed or have any deterioration in their finish.
- F. Bollards shall be set plumb with no metal burrs. Reflective tape shall be applied after paint has fully dried at least 7 days after paint application.

- G. Top of concrete footing shall be crowned in order to shed rain water. Exposed surfaces shall be smooth and shall have no cracks.
- H. Final acceptance shall be contingent upon conformance with specification requirements outlined in this specification.

3.07 PROTECTION OF WORK

- A. Newly painted surfaces shall be protected from damage by vehicles during the time required for paint to harden sufficiently to withstand traffic.
- B. Any damage to newly painted markings due to Contractor's failure to provide adequate protection will be repaired by him at no cost to the State.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

- A. All work specified in this section shall not be measured nor paid for separately but shall be considered incidental to Bid Item No. 3 – Repair – Fuel Station Pavement, of the Proposal and Proposal Schedule.

END OF SECTION

DIVISION 3 – CONCRETE

SECTION 03300 – CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mix design, placement procedures, and finishes.
- B. Related Sections include the following:
 - 1. Section 02200 – Earthwork.
 - 2. Section 02510 – Asphaltic Concrete Paving.

1.02 DEFINITIONS

- A. Cementitious Materials: Portland cement alone or in combination with one or more of blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume.

1.03 SUBMITTALS

- A. Submit in accordance with Section 01330 Submittal Procedures.
- B. Product Data: Reinforcing Steel: Certified mill test results or laboratory test results. Indicate bar size, yield strength, ultimate tensile strength, elongation and bend test.
- C. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments. Indicate amounts of mix water to be withheld for later addition at project site.
- D. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315, "Details and Detailing of Concrete Reinforcement." Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures. Also include location, sizes, and layout of any conduit to be placed within concrete. Shop Drawings shall be originally produced by the Contractor. Any reproduction of the Contract Drawings being used for shop drawings will be rejected.
- E. Material Certificates: Signed by manufacturers certifying that each of the following items complies with requirements:
 - 1. Form materials and form-release agents.
 - 2. Steel reinforcement and reinforcement accessories.
 - 3. Bonding agents.
 - 4. Adhesives.

5. Vapor retarders.
6. Joint-filler strips.
7. Repair materials.
8. Admixtures.
 - a. CO₂ Mineralization Technology: shall include a list of at least 3 projects that used the technology, SCMs, admixtures or combination thereof.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products complying with ASTM C 94 requirements for production facilities and equipment.
- B. Testing Agency Qualifications: An independent testing agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 to conduct the testing indicated, as documented according to ASTM E 548. Personnel conducting field tests shall be qualified as ACI Concrete Field-Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
- C. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, each aggregate from one source, and each admixture from the same manufacturer.
- D. ACI Publications: Comply with the following, unless more stringent provisions are indicated and maintain a copy at the field office.
 1. ACI 301, "Specification for Structural Concrete."
 2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."
 3. ACI 347R "Guide to Formwork for Concrete."

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

PART 2 – PRODUCTS

2.01 FORM-FACING MATERIALS

- A. Smooth-Formed Finished Concrete: Comply with ACI 347R. Provide new or good finish form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints. Plywood, metal, or other ACI 347R approved panel materials.
- B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least 2 edges and one side for tight fit.
- C. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4-inch by 3/4-inch, minimum.

- D. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces. Form oils or waxes shall not be used for concrete surfaces intended to be painted. Formulate form-release agent with rust inhibitor for steel form-facing materials.
- E. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.
 - 1. Furnish units that will leave no corrodible metal closer than one inch to the plane of the exposed concrete surface.
 - 2. Furnish ties that, when removed, will leave holes not larger than 1-1/2-inches in diameter in concrete surface.
 - 3. Furnish ties with integral water-barrier plates to walls indicated to receive damp proofing or waterproofing.

2.02 STEEL REINFORCEMENT

- A. Reinforcing Bars: ASTM A 615, Grade 60, deformed, unless otherwise noted on the drawings.
- B. Plain-Steel Wire: ASTM A 82, as drawn.

2.03 REINFORCEMENT ACCESSORIES

- A. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place that will not puncture the vapor retarder. Use plastic straps or brightly colored tie wires to secure reinforcing. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete or fiber-reinforced concrete of greater compressive strength than concrete. For concrete surfaces exposed to view where legs of wire bar support contact forms, use CRSI Class 1 plastic-protected or CRSI Class 2 stainless-steel bar supports. Refer to item entitled "STEEL REINFORCEMENT" herein below for chair support spacing.
- B. Joint Dowel Bars: Plain-steel bars, ASTM A 615, Grade 60. Cut bars true to length with ends square and free of burrs.

2.04 CONCRETE MATERIALS

- A. Portland Cement: ASTM C 150, Type II.
- B. Pozzolans:
 - 1. Fly Ash: ASTM C 618, Class C or F.
 - 2. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- C. Normal-Weight Aggregate: ASTM C 33, uniformly graded, and as follows:
 - 1. Class: Moderate weathering region, but not less than 3M.
 - 2. Aggregate Size: No. 67 (3/4-inch to No. 4).

- D. Size of Coarse Aggregate: Except when otherwise specified or permitted, maximum size of coarse aggregate shall not exceed 3/4 of the minimum clear spacing between reinforcing bars (or bundled bars), 1/5 of the narrowest dimension between the sides of forms, or 1/3 of the thickness of slabs or toppings.
- E. Water: Potable and complying with ASTM C 94 or non-potable meeting ASTM C 94 Acceptance Criteria for Questionable Water Supply. Use only potable water for job site mixing.

2.05 ADMIXTURES

- A. General: Admixtures certified by manufacturer to contain no more than 0.1 percent water-soluble chloride ions by mass of cementitious material and to be compatible with other admixtures and cementitious materials. Do not use admixtures containing calcium chloride.
- B. Water-Reducing Admixture: ASTM C 494, Type A.
- C. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
- D. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
- E. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
- F. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor, or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

2.06 IN-SITU CARBON DIOXIDE MINERALIZATION REQUIREMENTS

- A. Environmental / Sustainable Design Requirements:
 - 1. In-situ carbon dioxide mineralization in concrete: Supply concrete that has undergone in-situ carbon dioxide mineralization, such that post-industrial carbon dioxide (CO₂) is injected into the concrete during mixing and chemically converted into a mineral. The concrete may undergo mix optimization whereby the strength enhancement property of CO₂ is utilized to optimize cementitious content, pending that the CO₂ mineralization and optimized concrete mix meets concrete performance requirements as outlined in this specification document.
- B. Verification: Provide concrete producer's verification of in-situ mineralization of carbon dioxide.

2.07 CURING MATERIALS AND EVAPORATION RETARDERS

- A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.
- B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 ounce/square yard dry.
- C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

- D. Water: Potable.
- E. Clear, Solvent-Borne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B.
- F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, 18 percent to 22 percent solids.
- G. Clear, Solvent-Borne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
- H. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.

2.08 RELATED MATERIALS

- A. Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- C. Epoxy-Bonding Adhesive: ASTM C 881, 2-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class and grade to suit requirements, and as follows:
 - 1. Type II, non-load bearing, for bonding freshly mixed concrete to hardened concrete.
 - 2. Types I and II, non-load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
 - 3. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.
- D. Cementitious Coatings: Cement based polymer modified concrete finishing material, ProFinish by Bonded Materials or approved equal.

2.09 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8-inch and that can be feathered at edges to match adjacent floor elevations. Products shall contain no added gypsum.
 - 1. Cement Binder: ASTM C 50, Portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8-inch to 1/4-inch or coarse sand as recommended by underlayment manufacturer.
 - 4. Compressive Strength: Not less than 4000 psi at 28-days when tested according to ASTM C 109.

- B. Repair Topping: Traffic-bearing, cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4-inch. Products shall contain no added gypsum.
 - 1. Cement Binder: ASTM C 150, Portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 - 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
 - 3. Aggregate: Well-graded, washed gravel, 1/8-inch to 1/4-inch or coarse sand as recommended by topping manufacturer.
 - 4. Compressive Strength: Not less than 5500 psi at 28-days when tested according to ASTM C 109.

2.10 CONCRETE MIXES

- A. Prepare design mixes for each type and strength of concrete determined by either laboratory trial mix or field test data bases. Proportion normal-weight concrete according to ACI 211.1 and ACI 301. All design mixes shall include the use of carbon dioxide mineralization or equivalent technology. Other methods to reduce the cement content such as use of supplementary cementitious materials (SCMs) or admixtures such as C-S-H nanoparticle-based-strength-enhancing admixture (CSH-SEA) or equivalent may also be used to reduce the embodied carbon footprint include the combination of thereof the previously mentioned methods.
- B. Mat Foundations: Proportion normal-weight concrete mix as follows:
 - Compressive Strength (28-Days): 4000 psi.
- C. Slabs-on-Grade: Proportion normal-weight concrete mix as follows:
 - 1. Compressive Strength (28-Days): 4000 psi.
- D. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than Portland cement in concrete as follows:
 - Combined Fly Ash and Pozzolan: 10 percent
- E. Maximum Water-Cementitious Materials Ratio: 0.45.
- F. Do not add air entrainment to concrete of trowel-finished interior floors and suspended slabs. Do not allow entrapped air content to exceed 3 percent.
- G. Limit water-soluble, chloride-ion content in hardened concrete per ACI 318 Chapter 4 for corrosion protection of reinforcing steel.
- H. Admixtures: Use admixtures according to manufacturer's written instructions.
 - 1. Use water-reducing admixture or high-range water-reducing admixture (superplasticizer) in concrete, as required, for placement and workability.
 - 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

2.11 FABRICATING REINFORCEMENT

- A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.12 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94, and ASTM C 1116 and furnish batch ticket information. Batch ticket information shall include design mix reference, water that can be added at the job site, and admixtures. For transit mixing, complete not less than 70 revolutions of the drum at the manufacturer's rated mixing speed. Discharge concrete into its final position within 90 minutes after introduction of batch water to the cement. If a retarder admixture is used, the discharge time limit of 90 minutes may be increased by the time specified for retardation by the admixture manufacturer or the concrete supplier. Mix concrete a minimum of one minute at mixing speed immediately prior to discharge.

PART 3 – EXECUTION

3.01 FORMWORK

- A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until concrete structure can support such loads.
- B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.
- C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:
 1. Class A, 1/8-inch, for surfaces prominently exposed to public view, where appearance is especially important.
 2. Class B, 1/4-inch, for coarse-textured surfaces to receive plaster, stucco or wainscoating.
 3. Class C, 1/2-inch, for permanently exposed surfaces without additional finish.
 4. Class D, one inch, for surfaces, usually permanently concealed, where roughness is not objectionable.
- D. Construct forms to prevent loss of concrete mortar.
- E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to one vertical. Kerf wood inserts for forming keyways, reglets, recesses, and the like, for easy removal. Do not use rust-stained steel form-facing material.

- F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds. Maintain the integrity of the vapor retarder membrane.
- G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.
- H. Chamfer exterior corners and edges of permanently exposed concrete.
- I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the work. Determine sizes and locations from trades providing such items.
- J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.
- K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.
- L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.02 EMBEDDED ITEMS

- A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use Setting Drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
 - 1. Install anchor bolts, accurately located, to elevations required.
 - 2. Install reglets to receive top edge of foundation sheet waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.
 - 3. Install dovetail anchor slots in concrete structures as indicated.
 - 4. Install inserts, hangers, metal ties, nailing strips, blocking, grounds and other fastening devices needed for attachment of other work.
- B. Locate electrical or mechanical conduits and fittings so that the strength of the concrete member is not impaired. "Conduits" include pipes, ducts, and electrical conduits. Unless required otherwise on the drawings, conform to the following:

Concrete Slabs-on-Grade: Do not embedded conduits within the thickness of any concrete slab on grade. Place conduits in the subgrade below the concrete slabs.
- C. Obtain the Contracting Officer's approval to install conduit or pipe penetrations that may unduly impair the strength of the structural member (for example, multiple pipe penetrations near the face of a column).

3.03 REMOVING AND REUSING FORMS

- A. General: Formwork, for sides of beams, walls, columns, and similar parts of the work, that does not support weight of concrete may be removed after cumulatively curing at not less than 50 degrees F for 24-hours after placing concrete provided concrete is hard enough to not be damaged by form-removal operations and provided curing and protection operations are maintained. The 24-hour period may be reduced to 12-hours in compliance with ACI 347R with prior approval from the Contracting Officer.
- B. Leave formwork, for beam soffits and other structural elements, that supports weight of concrete in place until concrete has achieved the 28-day design compressive strength.
- C. Clean and repair surfaces of forms to be reused in the work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.
- D. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by the Contracting Officer.

3.04 SHORES AND RESHORES

- A. Comply with ACI 318, ACI 318M, ACI 301, and recommendations in ACI 347R for design, installation, and removal of shoring and reshoring.
- B. Plan sequence of removal of shores and re-shore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.05 STEEL REINFORCEMENT

- A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.
- B. Clean reinforcement of loose rust and mill scale, earth, and other foreign materials.
- C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.
 - Support slab reinforcing bars as follows:

BAR SIZE	MAXIMUM DISTANCE BETWEEN SUPPORTS
#3	2 feet
#4	3 feet
#5	4 feet
#3 at 12-inch E.W.	4'-6-inch o.c. each way

- D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

3.06 JOINTS

- A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

- B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by the Contracting Officer.
1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints, unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.
 2. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.
 3. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.
 4. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.
- C. Control Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct control joints for a depth equal to at least 1/4 of concrete thickness, as follows:
- Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.
- D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.
1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated.
 2. Terminate full-width joint-filler strips not less than 1/2-inch or more than one inch below finished concrete surface where joint sealants are indicated.
 3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.
- E. Dowel Joints: Install dowel sleeves and dowels or dowel bar and support assemblies at joints where indicated. Use dowel sleeves or lubricate 1/2 of dowel length to prevent concrete bonding to one side of joint.

3.07 CONCRETE PLACEMENT

- A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed. Provide one day notification to the Contracting Officer for each scheduled pour.
- B. Do not add water to concrete during delivery, at project site, or during placement, unless approved by the Contracting Officer.
- C. Convey concrete from mixer to the place of final deposit rapidly by methods that prevent segregation or loss of ingredients and will ensure the required quality of concrete. Use

conveying equipment, conveyors, hoppers, baffles, chutes, pumps that are sized and designed to prevent cold joints from occurring and prevent segregation in discharged concrete. Clean conveying equipment before each placement.

- D. Deposit concrete continuously or in layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as specified. Deposit concrete to avoid segregation.
- E. Deposit concrete in forms in horizontal layers with proper consolidation into previous layers and in a manner to avoid inclined construction joints. Place each layer while preceding layer is still plastic, to avoid cold joints. For high wall pours (above 12-feet), Contractor must show its experience and demonstrate its proficiency before the Contracting Officer will permit pours in excess of 12-feet.
 - 1. Consolidate placed concrete with mechanical vibrating equipment. Use equipment and procedures for consolidating concrete recommended by ACI 309R.
 - 2. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations no farther than the visible effectiveness of the vibrator. Place vibrators to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mix constituents to segregate.
 - 3. Make construction joints only where located on drawings unless otherwise approved by the Contracting Officer. Plan pours to continuously place concrete from one construction joint to another.
- F. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
 - 1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
 - 2. Maintain reinforcement in position on chairs during concrete placement.
 - 3. Screed slab surfaces with a straightedge and strike off to correct elevations.
 - 4. Slope surfaces uniformly to drains where required.
 - 5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, free of humps or hollows, before excess moisture or bleed-water appears on the surface. Do not further disturb slab surfaces before starting finishing operations.
- G. Hot Weather Placement: Place concrete according to recommendations in ACI 305R and as follows, when hot-weather conditions exist:
 - 1. Cool ingredients before mixing to maintain concrete temperature below 90 degrees F at time of placement. Chilled mixing water or chopped ice may be used to control

- temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Cover steel reinforcement with water-soaked burlap so steel temperature will not exceed ambient air temperature immediately before embedding in concrete.
 3. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade moisture uniform without standing water, soft spots, or dry areas.

3.08 CONCRETE SLABS-ON-GRADE

- A. For exterior areas, unless specified elsewhere, place concrete floor slabs directly over granular fill. Provide isolation and contraction joints where detailed and, at intersections, corners and at abutments. Place contraction joints not more than 40 feet apart, unless detailed otherwise. Finish concrete true to grade, section and cross slope for sloped or crowned walks at 1.5 percent (one percent minimum and 2 percent maximum). Round edges to 1/8-inch radius except saw-cut joints unless otherwise indicated. Finish steps in connection with walks with same finish as walks.

3.09 FINISHING FORMED SURFACES

- A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defective areas repaired and patched. Remove fins and other projections exceeding ACI 347R limits for class of surface specified.
- B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defective areas. Remove fins and other projections exceeding 1/8-inch in height.
 1. Apply to concrete surfaces exposed to public view or to be covered with a coating or covering material applied directly to concrete, such as waterproofing, damp-proofing, veneer plaster, or painting.
 2. Do not apply rubbed finish to smooth-formed finish.
- C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.10 FINISHING FLOORS AND SLABS

- A. General: Comply with recommendations in ACI 302.1R for screeding, restraighening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.
- B. Scratch Finish: While still plastic, texture concrete surface that has been screeded and bull-floated or darbied. Use stiff brushes, brooms, or rakes. Apply scratch finish to surfaces indicated and to surfaces to receive concrete floor topping or mortar setting beds for ceramic or quart tile, Portland cement terrazzo, and other bonded cementitious floor finishes.
- C. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Restraighten, cut down high spots, and fill

low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

- D. Trowel Finish: After applying float finish, apply first trowel finish and consolidate concrete by hand or power-driven trowel. Continue troweling passes and restraighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would telegraph through applied coatings or floor coverings.
1. Apply a trowel finish to surfaces indicated and to floor and slab surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin film-finish coating system.
 2. Finish surfaces to the following tolerances, measured within 24-hours according to ASTM E 1155 for a randomly trafficked floor surface. Specified overall values of flatness, F(F) 35; and levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and levelness, F(L) 17; for slabs-on-grade.
 3. Finish and measure surface so gap at any point between concrete surface and an unveled freestanding 10-foot-long straightedge, resting on 2 high spots and placed anywhere on the surface, does not exceed he following: 1/8-inch.
- E. Broom Finish: Apply a broom finish to exterior concrete platforms, walkways, steps, and ramps, and elsewhere as indicated. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with the Contracting Officer before application.

3.11 MISCELLANEOUS CONCRETE ITEMS

- A. Filling In: Fill in holes and openings left in concrete structures, unless otherwise indicated, after work of other trades is in place. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete work.
- B. Curbs: Provide monolithic finish to curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.
- C. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on drawings. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates of manufacturer furnishing machines and equipment.
- D. Electrical Work: Use 3/4-inch maximum size of aggregates for duct encasement. Unless detailed otherwise, encase underground ducts or conduits as follows:
1. Provide 3 inches minimum concrete cover around ducts or conduits. Use spacers to place and hold ducts. Provide 18-inches minimum earth cover over top of concrete encasement unless otherwise detailed.
 2. For future connections, provide a one-foot section of ducts or conduits to extend beyond concrete encasement and terminate with a coupling or end cap.

3.12 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and with recommendations in ACI 305R for hot-weather protection during curing.
- B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.
- C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing by one or a combination of the curing methods listed in paragraph entitled "Unformed Surfaces" herein below.
- D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces, by one or a combination of the following methods:
 - 1. Moisture Curing: Keep surfaces continuously moist for not less than 7 days with the following materials:
 - a. Water.
 - b. Continuous water-fog spray.
 - c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.
 - 2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12-inches, and sealed by waterproof tape or adhesive. Cure for not less than 7 days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.
 - a. Moist cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.
 - b. Moist cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.
 - c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer recommends for use with floor coverings.
 - 3. Curing Compound: Apply uniformly in continuous operation by spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within 3 hours after initial application. Maintain continuity of coating and repair damage during curing period.
 - 4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within 3 hours after initial application where recommended by the manufacturer. Repeat process 24-hours

later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.13 JOINT FILLING

- A. Prepare, clean, and install joint filler according to manufacturer's written instructions. Defer joint filling as long as possible. Do not fill joints until construction traffic has permanently ceased.
- B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

3.14 CONCRETE SURFACE REPAIRS

- A. Defective Concrete: Repair and patch defective areas. Remove and replace concrete that cannot be repaired and patched to the Contracting Officer's approval.
- B. Patching Mortar: Mix dry-pack patching mortar, consisting of one-part Portland cement to 2-1/2 fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.
- C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.
 - 1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2-inch in any dimension in solid concrete but not less than one-inch in depth. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.
 - 2. Repair defects on surfaces exposed to view by blending white Portland cement and standard Portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.
 - 3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by the Contracting Officer.
- D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.
 - 1. Repair finished surfaces containing defects. Surface defects include spalls, pop outs, honeycombs, rock pockets, crazing and cracks in excess of 0.01-inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.
 - 2. After concrete has cured at least 14-days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.
 4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.
 5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4-inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.
 6. Repair defective areas, except random cracks and single holes one inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mix as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.
 7. Repair random cracks and single holes one inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72-hours.
- E. Perform structural repairs of concrete, subject to the Contracting Officer's approval, using epoxy adhesive and patching mortar.
- F. Repair materials and installation not specified above may be used, subject to the Contracting Officer's approval.

3.15 FIELD QUALITY CONTROL

- A. Testing: Contractor shall engage and pay for a qualified independent testing and inspecting agency to sample materials, perform tests, and submit test reports during concrete placement according to requirements specified in the paragraphs below.
- B. Special Inspections: The State shall engage and pay for a special inspector to perform inspections and prepare special inspection reports.
- C. Special Inspection Items:
 1. Steel reinforcement placement.
 2. Steel reinforcement welding.
 3. Headed bolts and studs.

4. Verification of use of required design mixture.
 5. Concrete placement including conveying and depositing.
 6. Curing procedures and maintenance of curing temperature.
- D. Testing Services: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:
1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mix exceeding 5 cubic yards (4 cubic meters), but less than 25 cubic yards (19 cubic meter), plus one set for each additional 50 cubic yard (38 cubic meter) or fraction thereof.
 2. Slump: ASTM C 143; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mix. Perform additional tests when concrete consistency appears to change.
 3. Air Content: ASTM C 231, pressure method, for normal-weight concrete; ASTM C 173, volumetric method, for structural lightweight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mix.
 4. Concrete Temperature: ASTM C 1064; one test hourly when air temperature is 40 degrees Fahrenheit and below and when 80 degrees Fahrenheit and above, and one test for each composite sample.
 5. Compression Test Specimens: ASTM C 31; cast and laboratory cure one set of 4 standard cylinder specimens for each composite sample. Cast and field cure one set of 4 standard cylinder specimens for each composite sample.
 6. Compressive-Strength Tests: ASTM C 39; test 2 laboratory-cured specimens at 7 days and 2 at 28 days.
 - a. Test 2 field-cured specimens at 7 days and 2 at 28 days.
 - b. A compressive-strength test shall be the average compressive strength from 2 specimens obtained from same composite sample and tested at age indicated.
- E. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.
- F. Strength of each concrete mix will be satisfactory if every average of any 3-consecutive compressive-strength tests equals or exceeds specified compressive strength, and no compressive-strength test value falls below specified compressive strength by more than 500 psi.
- G. Test results shall be reported in writing to the Contracting Officer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in work, design compressive strength at 28 days, concrete mix proportions and

materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

- H. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by the Contracting Officer but will not be used as sole basis for approval or rejection of concrete.
- I. Moisture Vapor Emission Test: Standard test method meeting ASTM F 1869.
- J. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by the Contracting Officer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42 or by other methods as directed by the Contracting Officer.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

- A. All work specified in this section shall not be measured nor paid for separately but shall be considered incidental to Bid Item No. 3 – Repair- Fuel Station Pavement, of the Proposal and Proposal Schedule.

END OF SECTION

DIVISION 13 - SPECIAL CONSTRUCTION

SECTION 13282 - LEAD-CONTAINING PAINT CONTROL MEASURES

PART 1 - GENERAL

1.01 SUMMARY

- A. Furnish all labor, materials and equipment necessary to complete the safe removal, transportation and disposal of lead-containing paint, including lead-based paint, in areas that may be affected by the renovation activities in compliance with the Specifications and all applicable Federal, State and Local laws and regulations. If there is a conflict with the requirements, the more stringent requirement shall apply. Ignorance of the above requirements and any applicable regulations resulting in additional cost to the Contractor shall not be reimbursable or billable to the State. Any question regarding conflict or inconsistency between Specification and/or regulations should be directed to the State's Authorized Representative.
- B. The lead work shall include, but may not be limited to:
1. The Contractor is responsible for conducting his/her own site investigation to verify the quantities and locations of lead-containing paints.
 2. Areas including any lead-containing paint (LCP), including lead-based paint (LBP), that is loose and flaking or areas where LCP/LBP has the potential to become airborne or otherwise create dust (i.e., from sanding, drilling, friction, etc.) during the renovation activities. Lead was detected on painted surfaces of structures at the site as specified in *Limited Hazardous Materials Survey State of Hawaii Department of Transportation – Maui District Baseyard Expansion & Renovation, Part 2* located at 650 Palapala Drive, Kahului, Maui, Hawaii, dated May 10, 2022, prepared by EnviroServices & Training Center, LLC. The Contractor shall be responsible for conducting a site visit to verify all quantities and material locations.
 3. Preparation of work areas and removal, transportation, and disposal procedures. All work shall be performed as required of lead-containing and lead-contaminated materials by persons trained, knowledgeable and qualified in the techniques of handling and disposing of lead-containing and lead-contaminated materials and in the subsequent cleaning of lead-contaminated areas. Workers shall be EPA-certified lead workers and capable and willing to perform the work of this contract.
 4. Separation and recycling as scrap metal of renovation debris, steel components and miscellaneous metal elements. Debris and waste resulting from renovation work, except as otherwise specified, shall become the property of the Contractor.

1.02 REFERENCES

- A. The publications listed below form a part of this Specification to the extent referenced. The publications are referred to in the text by the basic designation only, and include but are not limited to, the following.
- B. CODE OF FEDERAL REGULATIONS (CFR)
29 CFR 1926.33 Access to Employee Exposure and Medical Record

29 CFR 1926.55	Gases, Vapors, Fumes, Dusts, and Mists
29 CFR 1926.59	Hazard Communication
29 CFR 1926.62	Lead Exposure in Construction
29 CFR 1926.65	Hazard Waste Operations and Emergency Response
29 CFR 1926.103	Respiratory Protection
40 CFR 260	Hazardous Waste Management Systems: General
40 CFR 261	Identification and Listing of Hazardous Waste
40 CFR 262	Generators of Hazardous Waste
40 CFR 263	Transporters of Hazardous Waste
40 CFR 265	Interim Status Standard for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 268	Land Disposal Restriction
40 CFR 745	Lead; Requirement for Lead-Based Paint Activities
49 CFR 172	Hazardous Materials, Tables, and Hazardous Materials Communications Regulations
49 CFR 178	Shipping Container Specification

C. HAWAII OCCUPATIONAL SAFETY AND HEALTH DIVISION (HIOSH)

12-114.2	Personal Protective Equipment
12-121.2	Fall Protection
12-122.2	Materials Handling, Storage, Use, and Disposal
12-148.1	Lead
12-151	Hazardous Waste Operations and Emergency Response

D. AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z88.2	(1992) Respiratory Protection
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E. DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

HUD Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing

F. UNDERWRITERS LABORATORIES INC. (UL)

UL 586	(1990) High-Efficiency, Particulate, Air Filter Units
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1.03 DEFINITIONS

- A. Action Level: Employee exposure, without regard to use of respirators, to an airborne concentration of lead of 30 micrograms per cubic meter of air averaged over an 8-hour period.
- B. Authorized Visitor: The State's Authorized Representative, Inspector, air monitoring personnel, or a representative of any regulatory or other agency having jurisdiction over the project.
- C. Competent Person: As used in this section, refers to a person employed by the Contractor who is trained in the recognition and control of lead hazards in accordance with current federal, State, and local regulations, has the authority to take prompt corrective actions to control the lead hazards and is an EPA-certified lead inspector or risk assessor.
- D. Contaminated Area: An area where unwanted toxic or harmful substance exists.

- E. Contractor: For this project, the Contractor is that individual, or entity under contract to the General Contractor to perform the herein listed work.
- F. State's Authorized Representative: Authorized State representative who is a Qualified Environmental Consultant (QEC), hired by the State, who performs inspection activities during abatement and renovation work and shall have the authority to initiate engineering controls.
- G. EPA: United States Environmental Protection Agency
- H. High Efficiency Particulate Air (HEPA) Filter: HEPA filtered vacuuming equipment with a filter system capable of collecting and retaining lead-contaminated particulate. A high efficiency particulate filter demonstrates at least 99.97 percent efficiency against 0.3-micron or larger size particles.
- I. Lead: Metallic lead, inorganic lead compounds, and organic lead soaps. Excludes other forms of organic lead compounds.
- J. Lead-Based Paint (LBP): Protective or decorative coating which contains at least 1.0 mg per square centimeter of lead by area or at least 0.5 percent (5,000 milligrams per kilogram) of lead by weight.
- K. Lead Containing Paint (LCP): Protective or decorative coating which contains any detectable quantity of lead; includes Lead-Based Paint.
- L. Lead Control Area: A temporary area or structure or containment, sometimes equipped with HEPA filtered local exhaust, that prevents the spread of lead dust or debris. Critical barriers and physical boundaries are employed to isolate the lead control area and to prevent migration of lead contamination and unauthorized entry of personnel.
- M. OSHA: United States Department of Labor, Occupational Safety and Health Administration
- N. Permissible Exposure Limit (PEL): 50 micrograms per cubic meter of air as an 8-hour time weighted average as determined by 29 CFR 1926.62. If an employee is exposed for more or less than 8 hours in a workday, the PEL shall be determined by the following formula:

$$\text{PEL (micrograms per cubic meter of air)} = 400/\text{number of hours worked per day}$$
- O. Physical Boundary: Area physically roped or partitioned off around lead control area to limit unauthorized entry of personnel.
- P. Qualified Environmental Consultant (QEC): An EPA-certified Lead Inspector/Assessor and who is an Industrial Hygienist or similar safety professional with experience in enforcing lead safety regulations and performing airborne lead sampling.
- Q. State: State of Hawaii

1.04 QUALITY ASSURANCE

- A. State's Authorized Representative's responsibilities:
 1. Review and approve Contractor personnel training.

2. Review and approve Contractor's Work Procedure Plan for conformance to the applicable reference standards.
3. Inspect work for conformance to the Contractor's approved Work Procedure Plan.
4. Schedule and conduct required air monitoring, inspection, and reporting.
5. Monitor work to verify that work is performed, at all times, in accordance with the requirements of this Specification.
6. Monitor work to verify that adequate control is being maintained at all times of hazardous exposure to employees and to the environment.
7. Be onsite during all worksite preparation and cleaning, be available by telephone, pager or answering service at all other times during the work and able to be present at the work site in no more than 2 hours.
8. After final cleanup, verify that the lead control area is free of any visible lead paint chip debris, waste or dust and that final area air samples have lead concentrations at or below the background level.

B. Safety and Health Compliance

1. In addition to the detailed requirements of this Specification, the Contractor shall comply with laws, ordinances, rules, and regulations of Federal, State, and local authorities regarding removing, handling, storing, transporting, and disposing of lead waste materials.
2. Comply with the applicable requirements of the current issue of 29 CFR 1926.62, HIOSH 12-148.1, and HIOSH 12-202-33.
3. Where requirements of this Specification and the referenced documents vary, the most stringent requirement shall apply.

C. Pre-Construction Conference

1. The State's Authorized Representative shall meet with the Contractor and State to discuss in detail the work procedures, precautions and area and personal air monitoring to be employed.
2. If rental equipment is to be used during lead-containing material handling and disposal, notify the rental agency in writing concerning the intended use of the equipment. Submit a copy of the written notification to the State's Authorized Representative.

1.05 CONTRACTOR'S RESPONSIBILITIES

- A. The Contractor acknowledges that he alone is responsible for the instruction of personnel in and enforcement of personal protection requirements. The Contractor shall comply with all requirements of 29 CFR 1926.62 and HIOSH 12-148.1. The Contractor shall also be responsible for complying with all applicable EPA regulations regarding lead-containing materials.

- B. The Contractor shall examine and have, at all times, at his office (one copy) and in view at each job site (one copy) the following materials:
1. State of Hawaii Department of Labor and Industrial Relations; Occupational Safety and Health Standards; Part 8, Section 12-148.1;
 2. Department of Housing and Urban Development; Office of Public and Indian Housing; Lead Paint Guidelines;
 3. Title 29 Code of Federal Regulations Part 1926.62; Safety and Health Standards;
 4. Title 29 Code of Federal Regulations Part 1910.134; Respiratory Protection;
 5. Title 40 Code of Federal Regulations Part 261; Identification and Listing of Hazardous Waste;
 6. Title 40 Code of Federal Regulations Part 262; Standards Applicable to Generators of Hazardous Waste;
 7. Title 40 Code of Federal Regulations Part 263; Hazardous Waste Transporters;
 8. Title 40 Code of Federal Regulations Part 745; Lead; Requirement for Lead-Based Paint Activities;
 9. Copies of any other applicable Federal, State and local regulations, standards, documents and codes;
 10. Copies of the procedures to be followed during medical emergencies, including phone numbers of the nearest hospital or other emergency medical facility, which shall be posted by the nearest telephone;
 11. Copies of the Contractor's Respiratory Protection Program, Hazardous Communication Program, Safety Program, and Work Procedure Plan;
 12. Copies of Safety Data Sheets for all chemicals used;
 13. Copies of the Contractor's Competent Person's qualifications and employee training Certificates; and
 14. Copies of Personal Air Monitoring results.
- C. Whenever approval of the State's Authorized Representative is required prior to proceeding with other work, the Contractor shall comply with the following:
1. The Contractor shall give, at a minimum, five (5) days notification to the State's Authorized Representative prior to the start of any lead work.
 2. The Contractor shall not begin any work without the State's Authorized Representative present onsite.
 3. The Contractor shall allow the State's Authorized Representative 24 hours from notification to respond to the request for site inspection(s).

4. The Contractor shall designate one person (either a foreman or superintendent) who will be authorized to request inspections. The name of the designated person shall be submitted in writing to the State's Authorized Representative prior to commencing work. Requests from any other person will not be considered official requests.
 5. The designated person requesting an inspection shall provide the following information:
 - a. Name of caller.
 - b. Building and rooms to be inspected.
 - c. Work phase of inspection, as specified.
- D. Pollution Control: The Contractor shall not contaminate the air, water, soil or other items with hazardous materials such as cleaning solutions, lead-containing paint or lead-contaminated debris and wastes, etc. The Contractor shall immediately clean the contaminated area and dispose of the waste in compliance with all Federal, State, and local laws, ordinances, rules and regulations at his or her own expense.
- E. Use of Site:
1. Confine operation at the site to the areas permitted under the contract. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting work while at the project site.
 2. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage to the areas authorized by the State's Authorized Representative.

1.06 COMMENCEMENT OF WORK

- A. Each time work that calls for the disturbance of lead-containing paint is to begin in a new work area the Contractor shall not commence work unless the following requirements have been met.
- B. Submittals: All submittals, notifications, posting and permits must be provided and be satisfactory to the State's Authorized Representative.
- C. Equipment: All equipment required for the work such as removal, clean-up and disposal must be on hand.

1.07 SUBMITTALS

- A. Submit in accordance with Section 01300 Submittals.
- B. Manufacturer's Catalog Data: Submit copies of manufacturer's specifications, installation instructions and field test materials for all chemicals and equipment related to lead-containing and lead-contaminated materials, including any other data that may be required to demonstrate compliance with these Specifications and proposed uses. This includes, but is not limited to, data for vacuum filters and respirators.
- C. Safety Data Sheets: Submit copies of the Safety Data Sheets for all chemicals used.

- D. Notifications: Submit written notification to the State's Authorized Representative 15 days prior to the start of any renovation or demolition work involving lead-containing materials.
- E. Respiratory Protection Program: Submit no later than 10 consecutive working days from notice of award, a copy of the Contractor's Respiratory Protection Program prepared in accordance with all applicable laws. The Contractor shall also submit fit test records on all employees to be used on this project who may be required to wear a respirator.
- F. Hazard Communication Program: Submit no later than 10 consecutive working days from notice of award, a copy of the Contractor's Hazard Communication Program prepared in accordance with all applicable laws.
- G. Safety Program: Submit no later than 10 consecutive working days from notice of award, a copy of the Contractor's Health and Safety Plan prepared in accordance with all applicable laws.
- H. Work Procedure Plan: Submit no later than 10 consecutive working days from notice of award, a copy of the Contractor's Work Procedure Plan. The following are required components of a Work Procedure Plan:
 - 1. A sketch showing the location, size, and details of lead control areas, signage, security, decontamination and support areas including eating, drinking, smoking, and restroom areas;
 - 2. Procedures, interface of trades, sequencing of lead-related work, respirators, protective equipment;
 - 3. A detailed description of the methods of control of the work to ensure that airborne lead concentrations of 30 micrograms per cubic meter of air are not exceeded;
 - 4. Work plan and schedule for waste containment and disposal including daily cleanup and disposal of stray paint chips and paint dust;
 - 5. List of waste handling equipment to be used in performing the work, to include cleaning, volume reduction, and transport equipment;
 - 6. Names and qualifications (experience and training) of personnel who will be working on-site with hazardous wastes;
 - 7. Estimated quantities of wastes to be generated and disposed of as well as a description of the methods used to identify hazardous wastes encountered with the work;
 - 8. Spill prevention, containment, and cleanup contingency measures to be implemented;
 - 9. Description of procedures to stop work in the event that area monitoring and laboratory analysis indicate air concentrations of lead in excess of the action level; and

10. Methods to eliminate runoff of the water used to minimize dust created by renovation work, and collection and disposal plan for wastewater and paint debris.

- I. Rental Equipment: When rental equipment is to be used during lead-containing material handling and disposal, a written notification concerning intended use of the rental equipment must be provided to the rental agency with a copy submitted to the State's Authorized Representative.
- J. HEPA Vacuums: Submit no later than 10 consecutive working days from notice of award, manufacturer's certification that vacuums conform to ANSI Z9.2-79, Fundamentals Governing the Design and Operation of Local Exhaust Systems as applicable to this project.
- K. Contractor's Competent Person's Qualifications: The Contractor shall submit no later than 10 consecutive working days from notice of award the Contractor's Competent Person's name, contact information, valid qualifications, and current certification of completion of the EPA Lead Inspector/Risk Assessor course.
- L. Certification of medical examinations: The Contractor shall submit documentation from a physician that all employees or agents who may be exposed to airborne lead-containing dust or fumes have been medically monitored to determine whether they are physically capable of working while wearing the respirator required without suffering adverse health effects. In addition, the Contractor shall document that his personnel have received medical monitoring as required in the HIOSH lead standard (12-148.1).
- M. Employee EPA Lead Worker/Supervisor Certifications: Submit no later than 10 consecutive working days from notice of award, documentation that each and every individual, including foreman, supervisors, other company personnel or agents, and any other individual who may be exposed to airborne lead dust and who may be responsible for any aspects of lead-containing paint removal activities which may occur, has currently attended and passed the EPA Lead Worker and/or EPA Lead Supervisor course, whichever is relevant to that worker's responsibilities. These courses shall be EPA-approved or approved by a State Accreditation Program in the most current listing of the Federal Register. No worker shall be allowed in the lead control area if they are found to have an expired accreditation certificate. The Contractor shall be responsible for keeping the documentation up to date and submitting subsequent documentation to the State's Authorized Representative before any additional employee or individual, not currently on the list, is allowed within the lead control area.
- N. Employee training certifications: Submit documentation within 10 consecutive calendar days of award, satisfactory to the State's Authorized Representative, that the Contractor's employees, including foreman, supervisors and any other company personnel or agents who may be exposed to airborne lead dust or who may be responsible for any aspects of lead work activities, have received training in accordance with OSHA 29 CFR 1926.62 and the HIOSH lead standard (12-148.1). Training shall include, but not be limited to, the dangers of lead exposure, respirator use and decontamination procedures.

O. Laboratory Qualifications:

1. Personal Air Monitoring Laboratory Qualifications - Submit name, address and telephone number of testing laboratory responsible for analysis of personal air monitoring samples and reporting concentrations of airborne lead.
2. TCLP Testing Laboratory - Submit name, address and telephone number of testing laboratory responsible for TCLP analysis.

P. Closeout Submittals:

1. Personal Air Monitoring Results: Submit test results to the State's Authorized Representative and the affected Contractor's employees within three (3) working days of collection, signed by the testing laboratory employee performing the analysis and the Contractor's Competent Person. Test results for the first two full days of initial personal air monitoring shall be submitted to the State's Authorized Representative within 48 hours after completion of sampling.
2. TCLP Results: Submit test results to the State's Authorized Representative within three (3) working days of collection, signed by the testing laboratory employee performing the analysis and the Contractor's Competent Person.
3. Log of Lead Disturbance Work: Complete and submit a daily log of all lead disturbance work performed.
4. Certification of work performance: Certification in writing that the regions both inside and outside of the lead control area have airborne lead concentrations below the background level, that the respiratory protection for the employees was adequate, and that the work procedures were performed in accordance with 29 CFR 1926.62 and this Specification.
5. Waste Disposal Manifest Forms: Submit copies of all transport manifests, trip tickets and disposal receipts for all hazardous waste removed from the work area and disposed of at a disposal facility during the work process.

PART 2 - PRODUCTS

2.01 EQUIPMENT AND MATERIALS

- A. Respirators: Select respirators approved by the National Institute for Occupational Safety and Health (NIOSH), Department of Health and Human Services. Respirators shall comply with the requirements of 29 CFR 1926.62 and HIOSH 12-148.1. For this project, respirators shall be worn, at all times, throughout the renovation or as deemed necessary by the Contractor's Competent Person.
- B. Protective Clothing: Furnish personnel exposed to lead dust with appropriate personal protective equipment as required by 29 CFR 1926.62 and HIOSH 12-148.1. For this project, respirators shall be worn, at all times, throughout the renovation or as deemed necessary by the Contractor's Competent Person.
- C. Chemicals: Submit applicable Material Safety Data Sheet for all chemicals used on this project. Use the least toxic product approved by the State's Authorized Representative.

PART 3 - EXECUTION

3.01 LEAD CONTROL AREA REQUIREMENTS

A. Boundary Requirements:

1. Establish a lead control area to contain renovation operations by demarcating a boundary around the structure to be demolished or renovated in accordance with the Contractor's approved Work Procedure Plan. The lead control area shall be isolated by physical boundaries, such as temporary fencing, boundary tape and rope, to prevent unauthorized entry of personnel.
2. Post Warning and Danger signs in accordance with 29 CFR 1926.62 and HIOSH 12-148.1. Signs shall be placed at all approaches to lead control area and at the boundary of the lead control area. Signs shall be posted at all locations where airborne lead concentrations may exceed ambient background levels. Locate signs at such a distance that personnel may read the sign and take necessary protective measures to avoid exposure. In addition, post signs with "Authorized Entry Only, Lead Control Area" and "PPE Required" at every entry point.

B. Personal Protection Requirements:

1. No one will be permitted in the lead control area unless they have been given appropriate training, Personal Protective Equipment (PPE) and medical examinations. PPE is required for all employees and persons within the lead control area.
2. Eating, drinking, smoking and application of cosmetics shall be permitted only in areas designated by the Contractor, approved by the State's Authorized Representative, and which are free of dust generated by the renovation. Eating, drinking, smoking and application of cosmetics are not permitted in the lead control area.
3. Where eyes may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes shall be provided within the work area.

C. Environmental Protection Requirements:

1. Ensure airborne lead levels outside the lead control area are below the Action Level.
2. Perform work without damage to or contamination of the areas adjacent to locations where lead-containing or lead-contaminated material will be disturbed as a result of renovation activities. If any part of the work area is damaged or contaminated during the disturbance of lead-containing materials, restore the damaged or contaminated area to its original condition or better, as determined by the State's Authorized Representative.
3. Drainage inlets, downspouts, and all entrances to underground utilities which lie within, or provide drainage for, a lead control area shall be sealed until that lead control area has been cleaned, visually inspected, and cleared.
4. Within a lead control area, any windows, doors, or vents shall be sealed and air-conditioning units with intake or exhaust in a lead control area shall be shut down

and sealed until that lead control area has been cleared with a level of airborne lead below the background level.

- D. Exit Procedures: Whenever personnel exit the lead control area, they shall perform the following procedures and shall not leave the workplace wearing any clothing or other equipment worn in the lead control area.
 1. Vacuum themselves off with HEPA-filtered vacuum equipment, using UL-586 labeled HEPA filters;
 2. Remove protective clothing in the designated changing area within the lead control area and place them in an approved impermeable disposal bag;
 3. Wash their hands and faces in the designated changing area before exiting to the designated clean area outside of lead control area; and
 4. Prevent migration of mud, dust and/or debris carried on work boots, clothing, or equipment from the renovation site into areas beyond the lead control area.

3.02 RENOVATION INVOLVING LEAD-CONTAINING PAINT

- A. Perform lead work as specified herein. Use procedures and equipment required to limit occupational exposure and environmental contamination with lead when renovation is performed in accordance with 29 CFR 1926.62 and as specified herein.
- B. Disturbance of lead-containing paint as a result of renovation activities shall be kept to a minimum. Spot remove lead-containing paint only as necessary for the safe renovation of LCP painted structures. Water spray, vacuuming and other engineering controls shall be used to minimize airborne lead dust. Care shall be taken to avoid pulverizing, scraping, or crumbling lead debris.
- C. Dispose of all lead-containing paint and associated waste in compliance with all Federal, State, and local requirements.
- D. Clean, as needed, all floor surfaces adjacent to the lead control area using a HEPA filtered vacuum.
- E. Use 6-mil polyethylene sheeting to cover ground underneath the work area.
- F. Use 6-mil polyethylene sheeting to cover any surfaces and equipment that will not be painted, disturbed, or utilized during disturbance of lead-containing paint. After completion of work, the Contractor shall repair all damage from fastening and sealing and remove all adhesive residue from surfaces at no additional cost to the State.
- G. Manual or power sanding, grinding, abrasive or sand blasting of interior and exterior painted surfaces is not permitted. Select removal processes (describe in the Work Procedure Plan) to minimize contamination of work areas with lead-contaminated dust or other lead-contaminated debris/waste.
- H. Open flame burning or torching of lead-containing paint is prohibited.

- I. The use of heat guns or hot knives which reach temperatures above 650 degrees Fahrenheit, on surfaces containing lead-containing paint, is prohibited.
- J. Use of vacuum equipment without HEPA filters in areas containing lead-containing paint is prohibited.
- K. The use of chemical paint strippers containing methylene chloride is prohibited.
- L. Control of Airborne Lead Level – The Contractor shall control the lead level outside of the work boundary to less than the action level, at all times.
- M. Control of Visible Emissions – The Contractor shall control lead dust emissions from the project site so that no visible lead dust emissions leave the project work areas during renovation work. Wet methods or other engineering controls shall be used to control the emission of dust and/or debris from the renovation site in accordance with all applicable Federal, State, and local regulations. Emissions in excess of the above shall be cause for immediate shut down of the project until corrective measures are implemented.
- N. Control of Water Runoff – Water used to control emissions of dust from the renovation activities shall not be allowed to flow uncontrolled from a lead control area, to any adjacent area or to enter the sanitary or storm water sewer system. All water runoff from lead control areas shall pass through a filter berm to remove particulate matter prior to discharge to water sewer system. The Contractor shall use only sufficient water to adequately control dust. Under no conditions shall wastewater be disposed of in storm drains or dumped on the ground.
- O. Perform renovation involving lead-containing paint as indicated in Federal, State, and local regulations. The worksite preparation (barriers or containments) shall be job dependent.

3.03 CLEANUP

- A. Clean surfaces and surrounding ground within the lead control area daily. Do not allow paint chips, dust and debris to accumulate.
- B. Restrict and minimize the spread of dust and debris. Keep waste from being distributed over the general area. Do not dry sweep or use compressed air to clean the area.
- C. When the operation has been completed, the area will be cleaned of all visible lead contamination. The State's Authorized Representative will visually inspect the affected areas for residual lead paint chips and debris, and the Contractor shall re-clean areas showing residual paint chips and debris.
- D. If re-cleaning is required, the State's Authorized Representative will visually inspect for lead debris after the re-cleaning. This process will be repeated until the State's Authorized Representative deems the area free of visible paint chips and debris.
- E. Do not remove the lead control area barriers or roped-off perimeter and warning signs prior to the State's receipt of the State's Authorized Representative's lead clearance certification.

3.04 DISPOSAL

- A. Disposal of Non-Hazardous Lead Construction Debris (TCLP for Lead Not Exceeding EPA Limit of 5.0 Milligrams per Liter):
 - 1. Remove non-hazardous lead waste including debris, scraps, waste materials, rubbish, and trash from the site and dispose of such waste at a landfill approved for such purposes.
 - 2. The Contractor shall submit to the State's Authorized Representative documentation that the lead-containing waste material removed from the work area has been accepted by the landfill owner.
- B. Disposal of Hazardous Lead Construction Debris (TCLP for Lead Exceeding EPA Limit of 5.0 Milligrams per Liter):
 - 1. Collect lead-contaminated wastes, scraps, debris and any other lead-contaminated materials and place into U.S. Department of Transportation approved and appropriately labeled containers.
 - 2. Store lead wastes and debris in U.S. Department of Transportation approved containers in an interim storage area assigned by the State's Authorized Representative at the site. Any and all hazardous wastes shall be removed from the site to an EPA approved disposal facility within 90 days of the removal work (as applicable).
 - 3. Handle, store, transport, and dispose of lead or lead-contaminated waste in accordance with 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 264, and 40 CFR 265. Comply with land disposal restriction notification requirements as required by 40 CFR 268.
 - 4. The Contractor shall submit to the State's Authorized Representative documentation that the lead-containing waste material removed from the work area has been accepted by the landfill owner.

3.05 CERTIFICATION

- A. The Contractor or his authorized representative shall certify in writing that the regions both inside and outside of the lead control area have airborne lead concentrations below the background level, that the respiratory protection for the employees was adequate, and that the work procedures were performed in accordance with 29 CFR 1926.62 and this Specification.
- B. Upon inspection and approval of the area by the State's Authorized Representative, the Contractor shall certify that there were no visible accumulations of lead-contaminated paint, dust and debris remaining on the worksite.
- C. The Contractor shall not remove the lead control area boundary and warning signs prior to the submittal and approval by the State's Authorized Representative of the Contractor's certification that there were no visible accumulations of lead contaminated paint, dust and debris remaining on the work-site.

- D. The Contractor shall re-clean areas showing residual paint chips, debris, or wastes. Chips, debris, and wastes shall be disposed of properly, in accordance with this Specification and all applicable Federal, State, and local regulations.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

- A. All work specified in this section shall not be measured nor paid for separately but shall be considered incidental to Bid Item No. 6 – Environmental, of the Proposal and Proposal Schedule. The final payment will not be made until a signed copy of the manifest from the treatment or disposal facility certifying the amount of lead-contaminated material delivered is submitted to the State.

END OF SECTION

SECTION 13288 – TESTING AND AIR MONITORING

PART 1 – GENERAL

1.01 SUMMARY

- A. This Section defines Contractor responsibility for inspection and monitoring while conducting work which disturbs materials that have potential to generate airborne hazards, such as lead-based paint (LBP) and lead-containing paint (LCP) for Maui District Baseyard Expansion & Renovation, Part 2 Project.
- B. Testing and monitoring shall be conducted for the purpose of:
 - 1. Verifying compliance with applicable codes, regulations, and laws regarding working with LCP/LBP.
 - 2. Ensuring that the legally required documentation is collected.
 - 3. Providing engineering controls during project to prevent exposures.
- C. Contractor must implement appropriate engineering controls and safety measures to prevent site workers, students, staff/faculty, other trades, the public, and the environment from exposure to hazardous materials. Costs incurred due to Contractor inability to control hazards shall be borne by Contractor, including but are not limited to, investigations, medical, legal, regulatory and public relations, clean-up, monitoring, and reporting.
- D. An independent industrial hygiene (IH) firm, retained by the State of Hawaii Department of Transportation (DOT), will conduct project monitoring during the performance of work which disturbs LCP/LBP. IH firm shall have no affiliation with Abatement Contractor.

1.02 DEFINITIONS

- A. Abatement Contractor: Firm engaged to remove, encapsulate, and/or dispose of ACM and LBP waste.
- B. Contractor: General Contractor of the Expansion & Renovation Contract.
- C. HUD: United States Department of Housing and Urban Development
- D. Industrial Hygienist (IH): Qualified industrial hygienist who will oversee and direct the project monitoring. His/her qualifications shall include at minimum five (5) years of experience in industrial hygiene and relevant hazard abatement projects. IH shall possess the State of Hawaii Asbestos Project Designer, Lead-Based Paint Risk Assessor or equivalent certifications.
- E. Industrial Hygienist Technician: Technician who works directly under the supervision of the IH and conducts daily project monitoring and collect relevant data and samples.
- F. Independent IH Firm: IH firm retained by DOT to inspect the work of the Contractor during the removal, encapsulation, and disposal of ACM or LBP and is capable to perform air monitoring, sampling, and testing prior to, during, and after material removal or mitigation.

1.03 COORDINATION

- A. Testing/air monitoring requirements included in the scope of work shall be coordinated with Section 01715 Existing Conditions – Hazardous Materials Survey and Section 13282 Lead-Containing Paint Control Measures.

1.04 PRE-CONSTRUCTION MEETING

- A. A meeting shall be held prior to site work and shall be conducted by Contractor.
- B. Attendance: Contractor, State, Industrial Hygienist, and Competent Person shall attend.
- C. Agenda
 1. Review final schedule for project.
 2. Review legal requirements and special and sensitive conditions and constraints.
 3. Verify compliance with pre-construction requirements, and obtain a copy of notifications.
 4. Review engineering controls, personal protective equipment, abatement equipment, and hazard control measures for workers, the students, staff/faculty, other trades, the public, and the environment.
 5. Review work procedures and responsibilities.
 6. Clarify the scope of work and its impact on the users of the building and the campus.

1.05 TESTING/AIR MONITORING/INDUSTRIAL HYGIENE SUPERVISION

- A. Industrial hygiene supervision and air monitoring shall be performed by an independent IH firm selected, retained, and paid for by DOT. IH firm shall not be paid by Abatement Contractor.
- B. Laboratory used for sample analysis shall be proficient in the National Institute for Occupational Safety and Health (NIOSH) Proficiency Analytical Testing (PAT) program.
- C. Air monitoring and project supervision shall be performed under the direction of an IH.
- D. On-site air monitoring and project supervision may be performed by a qualified industrial hygiene technician (IHT), provided all activities are performed under the supervision of the IH.

1.06 DESCRIPTION OF WORK:

- A. Furnish labor, materials, and equipment necessary to carry out the plan/preparation, hazard mitigations, hazardous material removal, personnel monitoring, record keeping, and proper disposal in compliance with applicable federal, state and local laws and regulations during the performance of the project.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.01 COMPETENT PERSON'S RESPONSIBILITIES

- A. Contractor's competent person shall prepare a Lead Hazard Control Plan per Section 13282 1.07 H.
- B. If required by the landfill, Competent Person shall provide Toxicity Characteristic Leaching Procedure (TCLP) results and waste documents. In the event that the waste is determined to be hazardous, inform State to obtain EPA ID number and to request equitable adjustment to the contract.
- C. Refer to Section 13282 Part 3, for additional responsibilities.

3.02 CONTRACTOR RESPONSIBILITIES

- A. Contractor is responsible for submitting complete work plans for review and concurrence by State. Refer to Sections 13282 for requirements of the Contractor's Work Procedure Plan.
- B. Contractor is responsible for worker monitoring and necessary records for the Contractor's employees as required by OSHA (29 CFR 1926.58), Hawaii Administrative Rules, and other applicable laws.
- C. Contractor shall obtain legally required documentation for air monitoring and submit a written respiratory protection program as part of the contract.
- D. Costs involving investigations, air monitoring, legal, medical, regulatory and public relations, testing, and reporting due to Contractor failure to control hazards shall be borne by Contractor, and shall be deducted from the final contract payment.
- E. Additional testing performed by the IH shall be accommodated by Contractor but shall not remove Contractor's responsibility of monitoring required by law and contract specifications.
- F. For final cleanup and decontamination following gross removal, remove the final polyethylene sheeting, or drop cloth, but leave the coverings for critical barriers, such as doors, windows, air ducts, etc., until successful clearance is obtained.
- G. Asbestos Clearance
 - 1. IH retained by DOT and Contractor's Competent Person shall jointly conduct visual inspection, and the IH will conduct air clearance prior to releasing the space to other trades. The clearance samples will be analyzed by Phase Contrast Microscopy (PCM) or Transmission Electron Microscopy (TEM). TEM air clearances shall be used on interior, friable school projects.
 - 2. PCM clearance result shall be less than 0.01 fibers per cubic centimeter of air (f/cc) or lower.
 - 3. TEM sampling and analysis shall be used for settling any disputes. TEM samples shall not exceed an average of 70 structures per millimeter squared.

4. Additional area air monitoring and/or testing necessary as a result of insufficient cleanup efforts by Contractor shall be borne by Contractor.

H. Lead Clearance:

1. IH retained by DOT and the Contractor's Competent Person shall visually inspect the affected surfaces for residual lead paint chips and accumulated lead-containing dust after the work is completed. Lead-in-dust wipe samples, where applicable, shall be collected once visual inspection passed. Lead dust wipe clearance levels shall be less than forty micrograms per milligram per square foot ($< 40 \mu\text{g}/\text{sq. ft}$) for floors and less than two hundred fifty micrograms per milligram per square foot ($< 250 \mu\text{g}/\text{sq. ft}$) for windowsills.
2. Additional area air monitoring and/or testing necessary as a result of insufficient cleanup efforts by Contractor shall be borne by Contractor.
3. The Contractor shall perform the Toxic Characteristic Leaching Procedure (TCLP) for Lead testing on all solid waste debris contaminated with lead (with the exception of painted scrap metal), in accordance with 40 CFR Part 261 "Identification and Listing of Hazardous Waste". The Contractor shall dispose of lead debris as hazardous waste if the waste is determined to be hazardous by the TCLP-Lead testing. If the TCLP-Lead testing indicates that the waste is non-hazardous, the Contractor shall dispose of the waste as non-hazardous, construction waste.

3.03 MONITORING AND INSPECTIONS BY COMPETENT PERSON

A. Duties of the Competent Person

1. Photographic Record of Project: Record work with representative photos. Photos shall become the property of the State and are to be accompanied by a detailed log.
2. Project Log: Competent Person shall be on site at all times and maintain daily field logs detailing key activities during ACM removal and LCP-related work, and submit a summary of project activities to State within 10 days of completion for each campus. Incorporate daily field reports with other project data into a final closeout report.
3. Visual Inspection of Controlled Areas: Perform inspections of controlled areas. Conduct inspections during the actual work performance to document the work practices employed. Verify that scheduled abatement or mitigation work is completed, and the area was properly and promptly cleaned and ready for other trades involved in the project.

B. Site Monitoring by Competent Person

1. Onsite personnel air monitoring as required by OSHA, and the project specifications
2. Monitoring of decontamination procedures at control area entry/exit and of cleanup after each shift
3. Monitoring of controlled area maintenance and waste handling
4. Interface with IH, school representatives, representatives of regulatory agencies, and the State

5. Ensure workers are trained, engineering controls in place, and proper respiratory protection is utilized by personnel within control areas
6. Relay to State any discrepancies in Contractor's action with provisions of project specifications

3.04 TESTING/AIR MONITORING

- A. IH retained by the State shall have authority to stop work or to exercise engineering controls during the project.
- B. IH may conduct additional testing and air monitoring at his/her discretion.
- C. Monitoring activities shall be documented and submitted to State with test results, interpretations, follow-up actions, and final resolutions.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

- A. All work specified in this section shall not be measured nor paid for separately but shall be considered incidental to Bid Item No. 6 – Environmental, of the Proposal and Proposal Schedule.

END OF SECTION

SECTION 13290 – CONTAMINATED MEDIA AND HAZARDOUS MATERIALS

PART 1 - GENERAL

1.01 SUMMARY

- A. This section describes determination and characterization of fill material for project sites and testing, handling, treatment and disposal of contaminated or hazardous items and material found in fill materials in accordance with the contract documents and specified in Subsection 107.16 – Contaminated or Hazardous Items and Material; Regulated Items and Material; Waste of the DOT Standard Specifications as determined by the Contracting Officer.
- B. Requirements of this section apply to all waste generated from sitework construction and demolition activities. It does not pertain to building or aboveground equipment which is covered in Section 13282 Lead-Containing Paint Control Measures and Section 13288 Testing and Air Monitoring of these Specifications.
- C. Related Sections include the following:
 - 1. Section 01567 – Environmental Protection.
 - 2. Section 02370 – Sediment and Erosion Control.

1.02 REFERENCES

- A. The “2005 Standard Specifications for Road and Bridge Construction”, State of Hawaii, Department of Transportation, hereafter referred to as the “DOT Standard Specifications.” (Paragraphs concerning Measurement and Payment are not applicable to this project.)

1.03 DEFINITIONS

- A. Inert Fill Material
 - 1. Inert Fill Material is defined in the Hawaii Revised Statutes (HRS) 2342H-1. Materials that do not meet this definition shall be disposed of at the appropriate Hawaii Department of Health (HDOH) Solid and Hazardous Waste Branch permitted solid waste management facility.
 - 2. The October 2021 State of Hawaii Department of Transportation, Highways Division, Construction Best Management Practices Field Manual, specifies inert fill material shall not be contaminated with asbestos or lead-based paint. In addition, inert fill materials do not decompose or produce leachate or other products harmful to the environment.
 - 3. Any material that originates from another project intended to be used as fill material is required to be recharacterized as fill material as described in this section.
- B. Lead-Based Paint: Lead Based Paint (LBP) is defined by section 403 of the Toxic Substances Control Act (TSCA), as amended by the Environmental Protection Agency (EPA) or as defined in approved subsequent revisions.
- C. Solid Waste: The Contractor shall dispose of solid waste directly from the project to a Solid Waste Management Facility that is permitted by the Hawaii Department of Health

(HDOH) Solid and Hazardous Waste Branch. Under no condition, the Contractor shall not temporarily store, process, or handle solid waste at an intermediate facility.

1.04 SUBMITTALS

- A. Submit in accordance with Section 01330 Submittal Procedures.
- B. Qualifications of Environmental Professional: Submit documentation the Environmental Professional has a minimum of five (5) years of experience in solid and hazardous waste management and fill material characterization within 30 calendar days of contract certification date.
- C. Solid Waste Disclosure Form.

PART 2 – PRODUCTS (Not Used)

PART 3 - EXECUTION

3.01 PRECONSTRUCTION REQUIREMENTS

- A. Retain the services of an Environmental Professional as accepted by the Contracting Officer.
- B. The Contractor shall submit a completed, signed, and dated “Solid Waste Disclosure Form for Construction Sites” to the Contracting Officer at the time of the Pre-Construction Conference and shall be included in the Site-Specific Construction BMP Plan as delineated in Section 02370 Sediment and Erosion Control. If there are any revisions to the information on the Solid Waste Disclosure Form, the form shall be re-signed, dated, and submitted to the Contracting Officer, prior to taking solid waste to the proposed facility.

3.02 CONSTRUCTION REQUIREMENTS

- A. For bid purposes, the Contractor shall assume that all waste generated from the project will be taken directly to a DOH permitted solid waste management facility of approved landfill. Submit monthly a copy of all the disposed receipts from the facilities permitted by the Department of Health, Solid Waste Section, (DOH) to receive solid waste to the Contracting Officer. Provide documentation monthly from any DOH permitted intermediary facility where the solid waste is handled or processed, all haul tags, and other documentation as directed by the Contracting Officer.
- B. If the Contractor elects to re-classify solid waste as inert fill material for reuse, the Contractor shall assume all costs and liability with regards to the testing, handling, storage, and end use of the material.
- C. If reclassifying solid waste as inert fill, submit written request to the Contracting Officer to seek approval before following requirements in this Section. No extension of time or costs will be granted due to any issue related to reclassification of material. The Contractor shall not assume material can be reclassified nor is there any guarantee that material can be reclassified. Reclassification of material will be at the sole determination of the Contracting Officer. If the material is to be reclassified as inert fill material, the Contractor shall provide the required documentation indicated in paragraph 3.01

Preconstruction Requirements and 3.03 Reclassification of Solid Waste into Inert Fill Material. The Contractor shall also revise the Solid Waste Disclosure Form to indicate the material was reclassified as inert fill and to identify the disposal location and re-submit the Solid Waste Disclosure Form to the Contracting Officer.

3.03 RECLASSIFICATION OF SOLID WASTE INTO INERT FILL MATERIAL

- A. If reclassifying solid waste as inert fill, obtain written acceptance from the Contracting Officer before following the requirements below for Inert Fill Material.
- B. Inert Fill Material: The State reserves the right to reject imported fill from any location including from sources known to contain hazardous material or if any of the requirements in this specification are not met. The sources and/or stockpiled location of the material shall remain accessible at all times to State personnel for sampling, testing, and inspection as determined by the Contracting Officer. Prior to importing/removal of material, the Contractor shall provide the specific location and quantity of material that is to be transported to/from the project site.
 1. Certificates. Provide a written certificate indicating that the fill material meets the inert fill material definition specified herein. The written certificate shall include a description of the evidence (including but not limited to historical documentation of land use, test results, fill material characterization report, and/or Phase I Environmental Site Assessment) used by the Contractor to determine that the fill material is inert fill material. The written certificate shall be prepared and signed by an Environmental Professional. Submit the written certificate to the Contracting Officer 14 calendar days before the fill material is imported to or removed from the project site. Do not import the fill material to, or export the fill material from the project site until the Contracting Officer has accepted the certificate. Revise the written certificate as requested by the Contracting Officer until the Contracting Officer has accepted the certificate at no additional cost to the State. If the Contracting Officer does not accept the certificate, the Contractor shall dispose of the fill material in accordance with all applicable Federal, state, and Local laws and regulations at no additional cost to the State.
 2. Documentation. Provide documentation that all the material is to be taken to a properly permitted site. The documentation shall include the location of the disposal site (name, address, Tax Map Key No., telephone number, and map) with a revised Solid Waste Disclosure Form to indicate the material that was reclassified as inert fill and the location that the inert fill will be taken to. Provide Final Distribution Certification for Soil Memorandum which includes Contractor's certification that the material was tested and determined clean and free of contaminants above HDOH Tier 1 Environmental Action Levels (EALs) for unrestricted use). The Contractor shall assume all liability for the material and comply with all applicable permits and contract requirements including section 107 Legal Regulations and Responsibility to Public, 203 Excavation and Embankment, and 209 Temporary Water Pollution, Dust, and Erosion Control of the DOT Standard Specifications.
 3. Laboratory Certification. Samples shall be tested by a laboratory certified to perform the specific analyses.
 4. Hawaii Department of Health Guidance Documents. The HDOH has published guidance documents for the characterization of fill material and construction and demolition (C&D) waste. Obtain and follow the latest versions of the applicable

HDOH guidance documents. Comply with all applicable Federal, State, and Local laws and regulations. The procedures of the most recent versions of the following guidance documents or their replacements for the determination and characterization of the fill material of may be used as a reference:

- a. Guidance for Soil Stockpile Characterization and Evaluation of Imported and Exported fill Material.
 - b. Evaluation of Fill Material for Chemical Contaminants (Fact Sheet).
 - c. Guidance for Construction & Demolition (C&D) Waste Disposal.
 - d. Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan.
- C. Lead Based Paint Restriction. Provide test results for lead-based paint testing as directed by the Contracting Officer a minimum of ten (10) working days prior to cold-planing existing pavement or other demolition activities. Remove lead-based paint from cold planed asphalt prior to use as a fill material. Lead based paint does not have to be removed if recycled for reclaimed asphalt for pavement.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

- A. Determination and characterization of fill material shall not be measured nor paid for separately but shall be considered incidental to Bid Item No. 6 – Environmental, of the Proposal and Proposal Schedule.
- B. The Contracting Officer will only measure testing, handling, treatment and disposal of contaminated or hazardous items and materials required and requested by the Contracting Officer on a force account basis in accordance with Subsection 109.06 – Force Account Provisions and Compensation. Payment will be full compensation for work prescribed in this section and contract documents.
- C. An estimated amount for force account is allocated in the proposal schedule under “Hazardous Materials Remediation”, but actual amount to be paid will be the sum shown on accepted force account records, whether this sum be more or less than the estimated amount allocated in the proposal schedule. The Contracting Officer will pay for measures requested by the Contracting Officer that are beyond the scope of work described in Section 107.16 – Contaminated or Hazardous Items and Material; Regulated Items and Material; Waste on a force account basis.
- D. The Contracting Officer may assess liquated damages up to \$27,500 per day for non-compliance of each requirement, all other requirements in this section and/or the contract shall be subjected to termination under Subsection 108.11-Termination of Contract for Cause, at the sole discretion of the Contracting Officer.
- E. For all citations or fines received by the Department for non-compliance, including compliance with State or Federal regulations and permits, the Contractor shall reimburse

the State within 30 calendar days for full amount of outstanding cost State has incurred, or the Contracting Officer will deduct cost from progress payment.

END OF SECTION

DIVISION 15 - MECHANICAL

SECTION 15000 - GENERAL MECHANICAL REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. These General Mechanical Requirements govern work specified under all sections of DIVISION 15 - MECHANICAL.

1.02 GENERAL REQUIREMENTS

- A. The Contractor shall furnish all labor, materials, tools and equipment and perform all work and services necessary for complete and properly operating mechanical work, equipment and systems, as shown in drawings and as specified in accordance with provisions of the Contract Documents and completely coordinated with work of all other trades.
- B. The Contractor shall completely examine the Contract Documents and shall report any error, inconsistency, or omission he discovers prior to submitting a bid.
- C. Furnish and install all supplementary or miscellaneous items, details, appurtenances and devices incidental to or necessary for a sound, secure and complete mechanical system where work required is not specifically indicated.
- D. Drawings and specifications shall be taken together. Provide work specified and not indicated or work indicated and not specified as though mentioned in both.
- E. The Contractor shall maintain at the site one copy of all Drawings, Specifications, Addenda, approved Shop Drawings, Change Orders and other modifications in good order and marked to record all changes made during construction. These shall be made available to the Contractor at all times.
- F. The Contractor at all times shall keep the premises free from accumulation of waste materials or rubbish caused by his operations. At the completion of the work, he shall remove all his waste materials and rubbish from and about the project as well as all his tools, construction equipment, machinery and surplus materials and shall clean all new equipment and accessories.
- G. The Contractor shall give the Department of Transportation timely notice of its readiness for testing any work including the data arranged so that the Contractor and representative of the Department of Transportation may observe such testing. The Contractor shall bear all cost of such tests.

1.03 SUBMITTALS

- A. Submit shop drawings, manufacturers' data and certificates for equipment, materials, finish and pertinent details for each system and have them approved before procurement, fabrication or delivery of the items to the job site. Partial submittals will not be acceptable and will be returned without review. Partial submittal for long lead equipment shall be accepted prior to complete submittal. Submittals shall include the manufacturer's name, trade name, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and paragraph reference, applicable industry and technical society publication references and other information necessary to establish contract compliance of each item the Contractor proposes to furnish.

- B. Shop Drawings: Drawings shall be 24 inches by 36 inches in size, except as specified otherwise. Drawings shall include floor plans, sectional views, installation details of equipment; and equipment spaces identifying and indicating proposed locations, layout and arrangement of items of equipment, accessories, piping and other items that must be shown to assure a coordinated installation. Drawings shall indicate adequate clearance for operation, maintenance and replacement of operating equipment devices. If equipment is disapproved, drawings shall be revised to show acceptable equipment and be resubmitted.

The Contractor shall review, stamp with his approval and submit, all Shop Drawings required by the Contract Documents or subsequently by the Contractor as covered by modifications. At the time of submission, the Contractor shall inform in writing of any deviation in the Shop Drawings from the requirements of the Contract Documents. By approving and submitting Shop Drawings, the Contractor certifies that he has determined and verified all field measurements and obstructions, field construction criteria, materials, catalog numbers and similar data, that he has checked and coordinated each Shop Drawing with the requirements of the work and of the Contract Documents and that all equipment fits within designated spaces.

- C. Manufacturers' Data: Submittals for each manufactured item shall be manufacturers' descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves and catalog cuts. Submittals shall include equipment certification terms and conditions, applicable self-diagnostic testing and start-up procedures. Equipment submittals shall specifically indicate the specified equipment assembly configurations with all specified standard and optional features, above and beyond general catalog products technical literature.
- D. Standards Compliance: When materials or equipment must conform to the standards of organizations such as the American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA) and Underwriters Laboratories (UL), American Society of Heating, Refrigeration and Air-Conditioning Engineers (ASHRAE) proof of such conformance shall be submitted to the Contractor for approval. If an organization uses a label or listing to indicate compliance with a particular standard, the label or listing will be acceptable evidence, unless otherwise specified in the individual sections. In lieu of the label or listing, the Contractor shall submit a certificate from an independent testing organization, which is competent to perform acceptable test and is approved by the Contractor. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's standard. For materials and equipment whose compliance with organizational standards or specifications is not regulated by an organization using its own listing or label as proof of compliance, a certificate of compliance from the manufacturer shall be submitted for approval. The certificate shall identify the manufacturer, the product and the referenced standard and shall simply state that the manufacturer certifies that the product conforms to all requirements of the project specification and of the referenced standards listed.
- E. Certified Test Reports: Before delivery of materials and equipment, certified copies of all test reports specified in the individual section shall be submitted for approval. Furthermore, submit a written certificate, dated and signed by an authorized corporate officer of the Contractor who is either a full-time employee, principal, or a full-time partner delegated with the authority to bind the Contractor in all matters relating to its professional work of the Contractor, evidencing the performance of any portion of the work, or any testing; as a condition precedent to the acceptance of any work or the result

of any test. Corporate credentials shall be furnished concurrently with applicable written certificates. Whenever a regulatory agency performs inspections or tests of any portion of the work, a written certificate shall be furnished by the Contractor to validate the results from the respective inspection test.

- F. Certificates of Conformance or Compliance: Submit all certificates applicable to all specified equipment assemblies and parts for the Contractor's approval prior to equipment delivery and commencement of equipment on-site installation. A certification from the manufacturer attesting those materials and equipment to be furnished for this project complies with the requirements of this specification and of the referenced publications. Preprinted certifications will not be acceptable; certifications shall be in the original. The certification shall not contain statements that could be interpreted to imply that the product does not meet all requirements specified, such as "as good as"; "achieve the same end use and result as materials formulated in accordance with the referenced publication," "equal or exceed the service and performance of the specified material." The certification shall simply state that the product conforms to the requirements specified. Furthermore, submit a written certificate, dated and signed by an authorized corporate officer of the Contractor who is either a full-time employee, principal, or a full-time partner delegated with the authority to bind the Contractor in all matters relating to its professional work of the Contractor, evidencing the performance of any portion of the work, or any testing; as a condition precedent to the acceptance of any work or the result of any test. Corporate credentials shall be furnished concurrently with applicable written certificates. Whenever a regulatory agency performs inspections or tests of any portion of the work, a written certificate shall be furnished by the Contractor to validate the results from the respective inspection test.
- G. Manufacturers' Certified Full Standard Product Warranty: Submit the manufacturer's certified Full Standard Product Warranty terms and conditions applicable to all specified equipment assemblies and parts for the Contractor's approval prior to equipment delivery and commencement of equipment on-site installation, as approved by the Contractor. All manufacturers' Full Standard Product Warranty certificates are to be provided to the Contractor the time of equipment delivery and prior to the commencement of equipment on-site installation.

Warranty shall cover all costs for parts, labor, associated travel, and expenses for a period of one year from project acceptance.

- H. Operation and Maintenance Manuals: Submit manuals on all equipment and the overall system upon successful completion of equipment on-site installation and start-up and prior to final inspection, as approved by the Contractor.
- I. Manufacturers' factory trained and certified service personnel: Prior to the equipment on-site installation, submit to the Contractor documentation as evidence of the respective manufacturers' certification of all personnel responsible for installation, testing, and start-up of the equipment.

1.04 LAWS, REGULATIONS AND CODES

- A. All work shall be in accordance with government laws, ordinances, rules and regulations and orders.
- B. The following shall govern where applicable; the Uniform Plumbing Code 2012, the International Building Code 2021, State of Hawaii Department of Health Regulations, Applicable National Fire Protection Association Standards, OSHA, Rules and

Regulations and all other codes and standards referenced in these specifications. Where requirements differ in these codes and standards, the more stringent shall apply.

1.05 TRADE NAME

- A. Mentioning of a trade name in the plans and specifications indicates that the manufacturer is acceptable to the Contractor. However, certain specified construction and details may not be regularly included in the manufacturer's catalogued product. The Contractor shall provide the material or equipment complete as specified.

1.06 PERMITS AND INSPECTIONS

- A. Applications for permits will be done by the Contractor. The Contractor shall pay for all necessary permits and fees.
- B. The Contractor shall apply and pay for all necessary inspections required by any public authority having jurisdiction.

1.07 DISCREPANCIES

- A. The Drawings and Specifications are intended to be cooperative. Any materials, equipment or system related to this section and exhibited on the Electrical or Mechanical Drawings but not mentioned in the Specifications are to be executed to the intent and meaning thereof, as if it were both mentioned in the Specifications and set forth on the Drawings.
- B. In case of differences between the Drawings and Specifications, the Specifications shall govern first, and then the Drawings. Large scale details shall take precedence over small scale Drawings as to the shape and details of construction. Specifications shall govern as to materials.
- C. Drawings and Specifications are intended to be fully cooperative and to agree, but should any discrepancy or apparent difference occur between Drawings and Specifications or should error occur in the work of others affecting the work, the Contractors shall be notified at once. If the Contractor proceeds with the work affected without instructions from a representative from the Department of Transportation, he shall make good any resultant damage or defect. All interpretations of Drawings and specifications shall be clarified by the Contractor.

1.08 WORKMANSHIP AND MATERIALS

- A. Workmanship shall be of the best quality and none but competent mechanics skilled in their trades shall be employed. The Contractor shall furnish the services of an experienced superintendent, who will be constantly in charge of the erection of the work, until completed and accepted.
- B. Unless otherwise hereinafter specified, each article of its kind shall be the standard product of a single manufacturer.
- C. Whenever the words "or approved equal" or other words of similar intent or meaning are used, implying that judgment is to be exercised, it is understood that it is the judgment of the Contractor that is referred to.
- D. The Contractor shall have the right to accept or reject material, equipment and/or workmanship and determine when the Contractor has complied with the requirements herein specified.

- E. All manufactured materials shall be delivered and stored in their original containers. Equipment shall be clearly marked or stamped with the manufacturer's name and rating. Equipment and materials shall be carefully handled, properly stored and adequately protected to prevent damage before and during installation, in accordance with the manufacturer's recommendations and as approved by the Contractor. Damaged or defective items, in the opinion of the Contractor, shall be replaced.
- F. References to standards are intended to be the latest revision of the standard specified.

1.09 MANUFACTURER'S RECOMMENDATIONS

- A. Equipment installed under this Division of the Specifications shall be installed according to manufacturer's recommendations, unless otherwise shown on the drawings or herein specified. Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, printed copies of these recommendations shall be furnished to the Contractor, prior to the installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can cause rejection of the material.

1.10 INSPECTION OF SITE

- A. This Contractor shall visit the site and examine the conditions affecting his work before submitting his proposal. The submission of the proposal shall be considered evidence that the Contractor has visited the site and no extra payments will be allowed to the Contractor on account of extra work made necessary by his failure to visit the site. If there are any questions or discrepancies in the design, the Contractor shall bring it to attention before submitting his proposal.

1.11 CONTINUITY OF SERVICES, PHASING

- A. Examine site and become familiar with existing local conditions affecting work.
- B. Examine all Drawings and Specifications (i.e., work from other trades) and become familiar with the types and systems of construction to be used. Determine how such types and systems will affect the installation of mechanical work.
- C. Investigate, determine and verify locations of any overhead utilities on or near the site. Determine such locations in conjunction with all public and private utility companies and with all authorities having jurisdiction.

1.12 OPENINGS, CUTTING AND REPAIRING

- A. The Contractor shall cooperate with the work to be done under other sections in providing information as to openings required in walls and slabs for all piping including sleeves where required.
- B. Any drilling or cutting required for the performance of work under this Section shall be the responsibility of this Contractor and the cost shall be borne by him.
- D. Holes in Concrete: The Contractor shall pay all costs for cutting holes. All holes through existing concrete shall be either core drilled or saw cut. All holes required shall have the approval of the Contractor prior to cutting and drilling.
- E. It shall be the responsibility of this Contractor to ascertain that all openings are properly located.

1.13 WARRANTY

- A. Contractor's Warranty: Provide a minimum warranty period of 1 year from the final acceptance of the work by the Department of Transportation.
 - 1. If the manufacturer's warranty is greater than the 1-year minimum requirement, the manufacturer's warranty shall supersede the minimum requirement.
 - 2. If the manufacturer's warranty period is less than the minimum requirement, the Contractor shall make up the difference.
 - 3. The Surety shall not be held liable beyond 1 year from the final acceptance date.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. As specified in all sections of DIVISION 15 - MECHANICAL.
- B. Materials and equipment shall be cataloged products of manufacturers regularly engaged in production of such materials or equipment and shall be the manufacturer's latest design that complies with the specification requirements. Materials and equipment shall be duplicate items that have been in satisfactory commercial or industrial use at least 2 years prior to bid opening. Where 2 or more items of the same class of equipment are required for these items shall be products of a single manufacturer; however, the component parts of the items need not be the products of the same manufacturer. Each item of equipment shall have the manufacturer's name, address, model number and serial number on the nameplate.
- C. The contractor shall provide all necessary options and/or accessories to comply with the applicable equipment specification requirements. Installation of the options and/or accessories shall be in accordance with the manufacturer's requirements and the complete assembly shall be warranted by the respective equipment manufacturer.
- D. The contractor shall provide certified manufacturer's representatives and/or service technicians for any field modification to mechanical equipment. The Contractor shall ensure that any modification to the equipment will not invalidate the manufacturer's warranty.

2.02 HOSE REELS

- A. Provide 50 feet air hose reels. Hose reels shall be compatible with both compressed air and water. Hose reels shall be spring return type and shall not contain electric motors. Hose reels shall be located with respect to fuel distribution equipment in accordance with NFPA 1, NPFA 30, and NFPA 30A wherever applicable. Hose reels shall have a maximum operating pressure of 250 psi. Operating temperatures shall range from 32 degrees F to 150 degrees F.
- B. Air Hose Reel Nozzle: Provide 316 stainless steel nozzle.
- C. Water Hose Reel Nozzle: Provide 316 stainless steel nozzle.

2.03 WATER PIPE

- A. Aboveground piping shall be Type "L" seamless rigid copper tubing conforming to ASTM B88 with wrought copper for cast copper alloy solder type fittings conforming to ANSI B16.22 or ANSI B16.18. Solder shall be 95-5 tin-antimony or approved equal.
- B. Solder and solder flux shall not contain lead. Flux shall be non-corrosive type. Self-cleaning flux shall not be used. The Contractor shall submit 5 copies of certificates stating that the solder and fluxes used are lead free.
- C. Dielectric Unions: Provide dielectric unions between ferrous and non-ferrous piping, Class 150.
- D. Valves:
 - 1. Two inches and Smaller: Ball, MSS SP-72, SP-110. Ball valve shall be full port (three piece or two piece) with a union design and adjustable stem package. Threaded stem designs are not allowed. The ball valve shall have a SWP rating of 150 psig and a CWP rating of 600 psig. The body material shall be Bronze ASTM B584, Alloy C844. The ends shall be solder type.
 - 2. Check Valves: Check valves less than 3 inches shall be Class 125, bronze swing check valves with non-metallic Buna-N disc. The check valve shall meet MSS SP-80 Type 4 standard. The check valve shall have a CWP rating of 200 psig. The check valve shall have a Y-pattern, horizontal body design with bronze body material conforming to ASTM B62, solder joints, with PTFE or TFE disc.

2.04 COMPRESSED AIR PIPE

- A. Stainless Steel Pipe (Aboveground): Type 316 stainless steel, ASTM A312, Schedule 40.
- B. Flange Gaskets: Provide non-asbestos compressed material in accordance with ASME B16.21, 1/16 inch thickness, full face or self-centering flat ring type. Gaskets shall contain aramid fibers bonded with styrene butadiene rubber (SBR) or nitrile butadiene rubber (NBR). NBR binder shall be used for hydrocarbon service.

PART 3 - EXECUTION

3.01 INSTALLATION AND WORKMANSHIP

- A. Provide competent and qualified manufacturer's factory trained and certified field service personnel on-site to be responsible for execution of all diagnostic testing in accordance with equipment manufacturer's installation and start-up certification requirements and warranty terms and conditions. Perform work using adequate numbers of personnel skilled in the appropriate trades, and provide adequate supervision and management of the work.
- B. All workmanship shall be of the highest standard. The piping systems shall be laid out to insure a neat, systematic and orderly arrangement of all work. Vertical piping lines shall be plumb and lines that are grouped shall be parallel and as direct as possible. Exposed pipe where indicated, shall be run parallel with walls.

3.02 PROTECTION OF MATERIALS AND EQUIPMENT

- A. Pipe openings shall be closed with caps or plugs during installation. Fixtures and equipment shall be tightly covered and protected against dirt, water, and chemical or

mechanical injury. Upon completion of all work the fixtures, materials and equipment shall be thoroughly cleaned, repainted as required, adjusted and operated.

3.03 CUTTING AND PATCHING

- A. The Contractor shall arrange for all cutting, fitting and patching necessary to accommodate the plumbing work as the job progresses and such cutting and patching shall be done by that trade experienced in the particular type of work required.

3.04 PIPING IDENTIFICATION

- A. Identification of all new pipe lines shall be by means of colored, waterproof, all temperature, self-adhering labels and directional arrow.
- B. All exposed pipes, whether insulated or not shall be identified. Labels may be omitted from piping where the use is obvious, due to its connection to equipment and where the appearance would be objectionable, as approved by direction.
- C. Identification labels shall be placed as follows:
 - 1. Near each valve and branch connection.
 - 2. Wherever piping merges or disappears from view from the floor of the room in which it is installed.
 - 3. Labels shall not be more than 50 feet apart.

3.05 EQUIPMENT IDENTIFICATION

- A. Identify all equipment with symbol and service conforming to that indicated on the drawings. Identification shall be on 1-1/4 inch by 3 inch laminated plastic nameplates securely fastened to the equipment. Leave manufacturer's nameplate clean, legible, and unpainted.

3.06 COORDINATION OF WORK AS SPECIFIED IN OTHER SECTIONS

- A. The Contractor is responsible for coordination with the General Contractor to assure proper layout, size, and location of mechanical equipment. The Contractor shall ensure that power and control wiring are provided and installed.

3.07 INSPECTIONS

- A. All work and materials are subject to field observation at any and all times by the Contractor.
- B. Contractor shall notify a minimum of 2 days prior to testing any piping which must be witnessed and approved before they are covered up or enclosed. Should the Contractor fail to notify at the times prescribed, it shall then be the Contractor's responsibility to make accessible any concealed lines, or demonstrate the acceptability of any part of the system. Any extra cost caused by the removal of such work shall be borne by the Contractor.
- C. If observer finds any material or work not conforming to these Specifications, Contractor within 3 days of being notified shall remove said materials from the premises and replace with approved material, at no cost.

3.08 OPERATIONAL ACCEPTANCE TESTS

- A. The Contractor shall perform all tests of the installed work and shall provide all services, labor, equipment, materials and instruments needed for the tests. During pressure tests all items in the system to be tested, not designed for test pressures, shall be removed or

isolated from the system and shall be reconnected or unblocked after tests are completed. Should operating tests require the presence of manufacturers' representatives, the Contractor shall cooperate with them and shall place at their disposal all assistance, materials and services required to perform such test. The Contractor shall certify in writing that all work has passed all required tests and shall complete the attached Operational Performance Tests form.

3.09 POSTED OPERATING INSTRUCTION

- A. Furnish approved operating instructions for each principal item of equipment for the use of the operation and maintenance personnel. Operating instruction shall be printed or engraved and shall be framed under glass or in approved laminated plastic and posted where directed by the Contractor. Operating instructions shall be attached to or posted adjacent to each principal item of equipment including start up, procedure in the event of equipment failure and other items of instruction as recommended by the manufacturer of each item of equipment. Operating instructions exposed to the weather shall be made of weather-resistant materials or shall be suitably enclosed and weather protected. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

3.10 INSTRUCTION TO CONTRACTOR PERSONNEL

- A. The Contractor shall furnish the services of competent instructors who will give full instruction to the designated personnel in the adjustment, operation and maintenance, including pertinent safety requirements, of the equipment or system specified. Each instructor shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work.
- B. Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Contractor for regular operation. The number of man-days (8 hours) of instruction furnished shall be as specified in other sections. When more than 4 man-days of instruction are specified, approximately half of the time shall be used for classroom instruction. All other time shall be used for instruction with the equipment or system. When significant changes or modifications in the equipment or systems are made under the term of the contract, additional instruction shall be provided to acquaint the operating personnel with the changes or modifications.

3.12 SAFETY REQUIREMENTS

- A. Belts, pulleys, chains, gears, couplings, projecting setscrews, keys and other rotating parts located so that any person can come in close proximity thereto shall be fully enclosed or properly guarded. High temperature equipment and piping so located as to endanger personnel or create a fire hazard shall be properly guarded or covered with insulation of a type as specified herein.
- B. Items such as catwalks, ladders and guardrails shall be provided where required for safe operation and maintenance of equipment.

3.13 CLEANUP AND REPAIRS

- A. Debris shall not be allowed to accumulate as a result of this work. Upon completion of this work, remove all debris and excess materials, tools, etc. resulting from this work from the jobsite and leave the location of this work broom-clean in a manner acceptable to the Contractor.
- B. This Contractor shall clean all fixtures and equipment set by him of oil, grease, stains, etc. All plates, trim, etc. shall be polished. Traps and drains shall be clean and unobstructed.

- C. All fixture piping and lines shall be thoroughly cleaned before leaving the work.

3.14 FINAL INSPECTION

- A. Final inspection shall be requested by the Contractor only after submittal of all required certificates. No final inspection will be made until all moving parts of equipment are properly guarded, all controls and safety devices tested and operative, all painting required done and the site cleaned up.

3.15 ACCEPTANCE TESTING OF COMPRESSED AIR SYSTEM

- A. Conduct pneumatic tests with dry, oil-free compressed air. Use carbon dioxide or nitrogen in metallic systems. Ensure that the testing takes place during steady-state ambient temperature conditions. Test ferrous piping systems at 1-1/2 times the maximum operating pressure. Maintain test pressure for at least 2 hours with an allowable pressure drop of 2 psi during that time. Remove components that could be damaged by test pressure from the piping systems to be tested. When testing reveals that leakage exceeds specified limits, isolate and repair the leaks, replace defective materials where necessary, and retest the system until specified limits are met.

3.16 GUARANTEE

- A. The Contractor shall guarantee the installation for a period of one year after 30 consecutive days of trouble-free operation after the date of acceptance of the project by the Contractor against any defects due to faulty materials, equipment, workmanship, or installation. Upon notice of defect, the Contractor shall correct; replace defective item at no additional cost.

3.17 CLEANUP AND WORK PRACTICES

- A. The Contractor shall keep the job site free of debris, litter, discarded parts, etc. and shall clean all oil drippings during the daily progress of work. The Contractor shall remove all tools, parts and equipment from the service areas upon completion of the work. The Contractor shall exercise caution during the progress of his maintenance and repair work to prevent damage to the ceilings, roofing and other building structure. The Contractor shall restore all damages, caused by his negligence, to its original condition at his own expense.
- B. All costs for periodic maintenance services and for emergency calls shall not be included in the lump sum bid price and shall be provided separately.
- C. The Maintenance Service Contract does not include repairs resulting from vandalism, negligent use or misuse of equipment.

3.18 OPERATION AND MAINTENANCE MANUAL

- A. Submit 3 hard bound copies of the Operating and Maintenance Manual on all equipment and the system as a whole. The manual shall identify project name and number, contractor, consultant, date and all equipment provided, It shall include the equipment manufacturer's name, model and serial number, tag no., capacity, quantity of units, their location and area (room) served and shall include the manufacturer's operation and maintenance manuals including control and wiring diagrams and source of service and replacement parts. When standard manufactures' brochures are used, adequately indicate (highlight, arrow, etc.) the project related information and delete (X or cross-out) the non-applicable information.

B. Distribution of submittal:

1 copy: User

3.19 SERVICE MAINTENANCE REPORT

DATE: _____ SHEET NO. _____

1. Name of Building and Location: _____

2. Submitted By: _____

3. Date of Service Call: _____

4. Name of Person(s) Making Call: _____

5. Time in: _____ Time Out: _____ At Site

6. Person(s) Contacted: _____

7. Nature of Service Call: (Routine Maintenance or Emergency, Explain)

8. Equipment Readings and Maintenance Performed: (List all items serviced: Identify -8a, 8b, 8c, ..., etc.)

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

A. All work specified in this section shall not be measured nor paid for separately but shall be considered incidental to Bid Item No. 4 – Fueling Systems, of the Proposal and Proposal Schedule.

END OF SECTION

SECTION 15193 - FUEL SYSTEMS (GASOLINE/DIESEL)

PART 1 - GENERAL

1.01 SUMMARY

- A. This Section includes gasoline and diesel fuel systems.
- B. Related Sections include the following:
 - 1. Section 15000 – General Mechanical Requirements.
 - 2. DIVISION 16 – ELECTRICAL.

1.02 GENERAL REQUIREMENTS

- A. Contractor shall inform Engineer of testing date a minimum of seven (7) calendar days prior to testing system.
- B. Provide all necessary labor, delegated design, materials, operations, equipment, tools and techniques required to furnish, install and test complete the fuel systems work as and within the limits indicated.
- C. Submit written request for interruption of the existing fuel system not less than thirty (30) calendar days prior to the time for which the interruption is requested.
- D. Prospective bidders shall visit the premises and familiarize themselves with all work details and conditions before submitting a bid. Reasonable modifications to indicated arrangements to suit actual conditions shall not constitute a basis for requesting additional funds from the State.
- E. Prior to ordering materials and equipment, the Contractor shall field verify all existing conditions, materials, sizes and dimensions that affect their work, and shall coordinate their work with all trades involved.
- F. Obtain all permits and pay the costs thereof. Arrange for inspections in sufficient time to avoid delay to the project. Provide copies of inspection reports.

1.03 LAWS, RULES, REGULATIONS AND REFERENCES

- A. The entire installation shall comply with the latest applicable rules and regulations of the County of Maui, the State of Hawaii, and any other applicable laws, codes, rules and regulations whether or not specifically mentioned hereinafter.
- B. Codes:
 - 1. Building Code, County of Maui.
 - 2. Fire Code, County of Maui.
- C. References:
 - 1. American Petroleum Institute (API) Publications
 - a. Spec 6D-14 Specification for Pipeline Valves

2. American Society of Mechanical Engineers (ASME) Publications
 - a. B16.21-13 Nonmetallic Flat Gaskets for Pipe Flanges
 - b. B16.39-14 Malleable Iron Threaded Pipe Unions: Classes 150, 250, and 300
 - c. B16.5 Pipe Flanges and Flanged Fittings: NPS 1/2 Through NPS 24, Metric/Inch Standard
3. American Society for Testing and Materials (ASTM) Publications
 - a. A312-14 Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
4. National Fire Protection Association (NFPA) Publications
 - a. 30-12 Flammable and Combustible Liquids Code
 - b. 70-14 National Electrical Code
5. Underwriters Laboratories (UL) Publications
 - a. 330-09 Standard for Hose and Hose Assemblies for Dispensing Flammable Liquids
 - b. 567-03 Standard for Emergency Breakaway Fittings, Swivel Connectors and Pipe-Connection Fittings for Petroleum Products and LP-Gas
 - c. 674-11 Standard for Electric Motors and Generators for Use in Division 1 Hazardous (Classified) Locations
 - d. 698A-12 Standard for Industrial Control Panels Relating to Hazardous (Classified) Locations
 - e. 1203-13 Standard for Explosion-Proof and Dust-Ignition-Proof Electrical Equipment for use in Hazardous (Classified) Locations

1.04 SUBMITTALS

- A. Submit in accordance with Section 01330 Submittal Procedures and Section 15000 General Mechanical Requirements.
- B. Shop Drawings
 1. The Contractor shall submit shop drawings showing the entire work and dimensions. Contractor shall check project drawings to avoid interferences. No fuel system work shall commence until such plans have been approved and accepted by the Engineer. Any deviations from the shop drawings shall require approval by the Engineer.
- C. Submit the following:
 1. Manufacturer's product data.
 2. Shop drawings.

3. Safety Data Sheets.
4. Test reports.
5. As-built drawings.
6. Certificates.
7. One-Year Guarantee.
8. Operation and Maintenance Manual.
9. Aboveground Fuel Storage Tank Warranty (30-year). The Surety and the Contractor shall not be held liable beyond two (2) years from Project Acceptance Date.

1.05 NOTICES AND OTHER REQUIREMENTS

- A. The Contractor shall submit to the Fire Prevention Bureau the following:
 1. Fuel storage tank permit application with one (1) set of installation and upgrade drawings.

1.06 ELECTRICAL WORK

- A. Contractor shall provide all wiring, conduits, controls, and disconnects for equipment. Contractor is responsible for coordination of size, voltage, phase, auxiliary contacts, etc. Should any equipment require electrical service or wiring other than as shown on the electrical drawings, inform the Engineer and advise the Electrical Contractor of such changes. All control devices must be installed to operate within the manufacturer's rated current and voltage. All control circuits must be through the respective equipment's disconnect to ensure the control circuit being off when equipment disconnect is off. All switches, starters, wiring devices and controls mounted where exposed to weather shall have Type 316 stainless steel NEMA 4X enclosures. Wiring materials and methods shall conform to DIVISION 16 - ELECTRICAL, applicable National Electrical Codes, and NEMA standards.

PART 2 - PRODUCTS

2.01 PRODUCT CARRIER PIPE AND FITTINGS

- A. Stainless Steel Pipe (Aboveground): Type 316 stainless steel, ASTM A312, Schedule 40.
- B. Flanges: Provide flanged end connections on system components, fittings, piping, piping components, adapters, couplers, and valves that conform to ASME B16.5, Class 150. Stainless steel flanges must conform to ASTM A182/A182M, Grade F304, forged type.
- C. Flange Gaskets: Provide non-asbestos compressed material in accordance with ASME B16.21, 1/16 -inch thickness, full face or self-centering flat ring type. Gaskets shall contain aramid fibers bonded with styrene butadiene rubber (SBR) or nitrile butadiene rubber (NBR). NBR binder shall be used for hydrocarbon service.
- D. Joint Compound: Joint compound for piping system shall be resistant to water and be suitable for use with fuel containing 40 percent aromatics.

- E. Pipe Supports: Supports must be the adjustable type conforming to MSS SP-58, except as modified herein. Provide Type 316 Stainless Steel rods, nuts, bolts, washers, hangers, and supports.

2.02 VALVES

- A. Ball Valve: Valve shall be the non-lubricated, double seated, ball type that conforms to API Spec 6D. Valve shall operate from fully open to fully closed with 90 degree rotation of the ball. Valve shall be capable of 2-way shutoff. Valve shall be constructed of Type 316 stainless steel. Valves shall have one piece bodies and shall have a minimum bore not less than 55 percent of the internal cross sectional area of a pipe of the same nominal diameter.
- B. Check Valve: Valve shall be the full-opening, tilting disc, non-slam, swing type that conforms to API Spec 6D. Discs and seating rings shall be renewable without removing from the line. The disc shall be guided and controlled to contact the entire seating surface. Valve body must be constructed of 316 Stainless Steel.
- C. Solenoid Valve (anti-siphon motorized ball valve): 2-way, normally closed (i.e. powered open), solenoid operated valve with 316 stainless steel body and FKM elastomeric seal. 120 volt AC, 60 Hz, Type 7, explosion proof Class 1, Division 1, Group A, B, C, D enclosure. Valve shall be ASCO series, Magna-Trol or approved equal.
- D. Pressure / vacuum relief valve: Valve must be the pressure/vacuum vent relief type that conforms to NFPA 30. Valve pressure and vacuum relief settings must be set at the factory. Pressure and vacuum relief must be provided by a single valve. Valve body must be constructed of 316 Stainless Steel or Marine grade aluminum. Valve trim must be stainless steel. Inner valve pallet assemblies must have a knife-edged drip ring around the periphery of the pallet to preclude condensation collection at the seats. Pallet seat inserts must be of a material compatible with the fuel specified to be stored. Valve intake must be covered with a 40 mesh stainless steel wire screen.
- E. Foot Valve: Valve must be the self-activating, double-poppet, shutoff type that prevents fuel flow from reversing. Valve must conform to NFPA 30. Valve body must be constructed of either 316 stainless steel. Valve must be provided with a minimum 20 mesh stainless steel screen on the intake. Valve seats must be the replaceable type. Valve must be capable of passing through a 3 inch pipe or tank flange.

2.03 UNIONS

- A. Unions shall conform to ASME B16.39, Class 150. Unions materials shall conform to ASTM A312, Grade 316. Dielectric unions shall conform to dimensional, strength, and pressure requirements of ASME B16.39, Class 150. Union shall have a water-impervious insulation barrier capable of limiting galvanic current to one percent of the short-circuit current in a corresponding bimetallic joint. When dry, union shall be able to withstand a 600-volt breakdown test.

2.04 FLEXIBLE PIPE CONNECTOR

- A. Connector shall be the flexible, close pitch, metal hose type that is constructed with exterior annular corrugations and provided with a single layer of braided wire sheath covering. Connectors shall be constructed entirely of stainless steel and be rated for the system working pressure and temperature.

2.05 ABOVEGROUND FUEL STORAGE TANK

- A. All tanks, panels, appurtenances, and accessories shall be furnished from the same supplier. Aboveground fuel storage tank shall be double-wall, horizontal, protected type, listed and tested in accordance with UL 2085. Capacity of the tank shall be as listed on the drawings. Tank shall be constructed in accordance with UL 142. Annular space insulation material shall be a minimum of 3-inches thick, and shall be UL 2085 listed. Provide a factory-assembled unit that includes a factory-fabricated primary storage tank and an integral secondary containment. Tank assembly must be in accordance with NFPA 30, NFPA 30A, NFPA 31 and be designed and manufactured for a horizontal cylindrical installation. Primary storage tank must be factory-welded, TP 316 stainless steel that conforms to UL 142. Tank assembly must be mounted on the tank manufacturer's standard UL listed support skid that elevates the tank assembly above the underlying concrete slab or support saddles. Tank assembly must have lifting lugs that allow tank relocation. Provide tank assembly with the stairway and platform assembly, except as modified herein. The stairway and platform assembly must be constructed of structural steel TP 316 stainless steel and/or fiberglass reinforced plastic (FRP). Provide stairway and platform as indicated on the drawings. Tank shall bear the UL 2085 label for "Insulated Secondary Containment Aboveground Tank for Flammable Liquids" and provided with a minimum 30-year warranty.
- B. Double Wall Steel Tank (Fire-Resistant, Protected): The secondary containment (outer) tank must be a factory-fabricated, TP 316 stainless steel, tank that fully-encloses the primary storage tank and must conform to UL 142. The interstitial space between the primary tank and the containment tank must be both pressure testable and verifiable. The entire tank assembly must conform to UL 2085 and bear the UL 2085 label. The primary storage tank must be supported within the containment tank with steel tank saddles, or other similar supports, fabricated and installed by the tank manufacturer.
- C. Exterior Surfaces, Aboveground Tanks: Protect the exterior surfaces of each aboveground tank with the manufacturer's standard coating system.
- D. Fuel Storage Tank Accessories.
1. Emergency Tank Vents: Vent must be the normally-closed, UL listed type that vents outward and upward. Vent must conform with NFPA 30 and UL 142 and must be sized by the tank manufacturer. Provide vent with the cubic feet per minute (cfm) rating permanently labeled on the vent's exterior. For double wall or protected type tanks, provide a second emergency vent to protect the interstitial space.
 2. Atmospheric Vent: Provide an atmospheric vent conforming to applicable requirement of NFPA 30 or NFPA 30A. Vent pipe shall terminate at least 12 feet above grade or 2 feet above and located so that discharged vapors will not enter building openings, under building eaves, or downspouts.
 3. Mechanical Clock Gauge: Gauge must be the level sensing, mechanically actuated type that provides the tank level readout in a sealed glass cap contained in a gauge box. Gauge must be accurate to plus or minus 1/4 inch and must measure the liquid level over the full range of a tank's height. Gauge must have vapor tight seals to prevent condensation from fogging the viewing glass.
 4. Dielectric Bushings: Provide nylon dielectric bushings on metallic piping connections to steel tanks.

2.06 FUEL STORAGE MONITORING SYSTEM

- A. Fuel storage tank monitoring system shall be NEMA 4X enclosure with automatic tank gauging, interstitial space leak sensor, integral printer with 5 spare rolls of printer paper, inventory probe, leak sensors, digital and analog outputs. All components of the system shall be provided by a single manufacturer.
- B. The control panel shall be constructed of UL listed, electronic components. The control panel power source shall be 120 volts A.C. The tank gauge probe and sensor monitoring circuits shall be intrinsically safe circuits. Panel shall incorporate self-test system, which will permit operator verification of proper operation of leak detection equipment.
- C. The control panel shall include a power on light, alarm light and bell, alarm test button and silence switch, alarm dry contact and alpha-numeric display. The system shall activate the panel alarm light and bell for high or low tank levels and leak detection.
 - 1. Setpoints: Configure the alarm system's 2 setpoints in accordance with the following:
 - a. High Level Setpoint. Produce an alarm condition when a tank's liquid level rises above 90 percent capacity.
 - b. Low Level Setpoint. Produce an alarm condition when a tank's liquid level drops below the minimum pump submergence level at 5.
- D. The factory assembled, internal tank gauge probe shall be fitted to the tank and shall conduct monthly automatic tank gauging and testing.
- E. Tank basin space leak sensor shall be factory fabricated, with a two wire cable long enough to locate the sensor at the bottom of the tank interstitial space. The sensor shall detect any liquid in the basin and trigger an alarm.
- F. Panel shall be in a NEMA enclosure suitable for the environment and have an audible and visual alarm for each zone and include acknowledgement switch and rechargeable battery backup capable of operating the system continuously for a minimum of 48 hours. Panel shall incorporate self-test system which permits operator verification of proper operation of leak detection equipment. Mount panel as indicated. Provide instructions and equipment required for calibration of leak detection system and manufacturer's recommend calibration maintenance schedule.

2.07 PRODUCT DISPENSING UNIT

- A. Dispensers, dispenser pumps, hoses, nozzles, and fuel management controller shall all be furnished by the same supplier.
- B. Provide dispenser, single sided, remote type, with one hose outlets each suitable for single product delivery flow rate of 22 gallons per minute from each nozzle. Steel frame shall be capable of resisting normal vertical and lateral loads. Exterior panels shall be stainless steel with embossed brush finish. Dispenser shall be furnished with a single integral pump.
- C. Internal Filters: Replaceable filter element on each product line with a nominal filtration efficiency of 25 microns with a flow rating equal to the rate of the dispensing unit.
- D. Internal Strainer: 80-mesh removable strainer included in filter adapter housing. One strainer per hose position.

- E. Accessories: Equip dispensing unit with accessories such as built-in air eliminators, line check valves, and emergency shut-off valve. Install centering ring or stabilizer bar to ensure proper shearing action for emergency shut-off valve if the dispensing unit is knocked from its supports.
- F. The dispenser shall be provided with integral relay capable of signaling tank control panel when fuel is flowing.
- G. Hose: Provide dispensing hose conforming to UL 330, gasoline and oil resistant, statically grounded, flexible in sub-zero temperatures. Provide a minimum of 12 -feet of hose for each product line on the dispenser. Provide each hose with spring loaded cable to return device attached near mid-length of hose.
- H. Nozzles: Dispensing nozzles shall be automatic shutoff type, stainless steel, without latch-open device, aluminum body, and full hand insulator to prevent splash-back.
- I. Breakaway Device: Provide each product hose with UL listed emergency breakaway device designed to retain liquid on both sides of breakaway point. Breakaway device shall have pressure balancing chamber to override line pressure to prevent nuisance breaks caused by a restriction in delivery hose diameter.
- J. Dispenser shall be capable of interfacing with fuel management controller.
- K. Under-Dispenser Sump: Aboveground stainless steel dispenser containment sump, includes interchangeable upper frame and stabilizer bar assemblies.
- L. Flexible Connectors: Flexible metal hose, corrugated type with braided wire sheath covering, close-pitch annular corrugations, rated for working pressure of at least 125 psig, 12 -inch minimum live length, threaded end connections and shall conform to requirements of UL 567. Metal for hose and braided wire sheath shall be ANSI 300 series stainless steel.

2.10 FUEL MANAGEMENT CONTROLLER

- A. Controller shall be capable of interfacing with a minimum of 2 dispensing units.
- B. Controller shall be capable of RFID tag recognition.
- C. Include a color LCD high brightness display.
- D. Furnish with stainless steel housing.
- E. Unit shall contain an integral wireless gateway and also be capable of hard-wire data connection.
- F. Unit shall contain a compact, self-contained outdoor printer.

2.11 FUEL STORAGE TANK REMOTE FILL PORT

- A. Automatic fuel port. Post mounted with NEMA 4X lockable Type 316 stainless steel enclosure, OPW Kamvalok dry disconnect coupler, quick disconnect hose coupling with dust plug, check valve, and ground stud.

2.12 DIESEL EXHAUST FLUID CONTAINER

- A. Container shall have a capacity of 55 gallons and made of a material that is fuel resistant including stainless steel, polyethylene, or polypropylene or approved equal. Container shall be furnished with air hand pump and DEF fuel supply nozzle with 12' hose. DEF container shall be provided within 316 stainless steel or FRP housing per drawings.

2.13 PIPING IDENTIFICATION

- A. Aboveground Piping: For pipes 3/4 inch OD and larger, provide printed legends to identify contents of pipes and arrows to show direction of flow. Color code label backgrounds to signify levels of hazard. Make labels of plastic sheet with pressure-sensitive adhesive suitable for the intended application. For pipes smaller than 3/4 inch OD, provide brass identification tags 1-1/2 inches in diameter with legends in depressed black-filled characters.

Warning Tape Color Code

Yellow: Gas, oil, petroleum or gaseous materials.

Orange: Communication, alarm or signal lines, conduit, telephone, fiber optic cable.

2.14 MISCELLANEOUS METALS

- A. Preformed slotted channel system components used in supports and brackets shall be Type 316 stainless steel, Unistrut Corporation or approved equal.

2.15 ACCESSORIES

- A. Concrete Anchor Bolts: Concrete anchors must conform to ASTM F593, Grade C, TP 316 stainless steel.
- B. Bolts and Studs: TP 316 stainless steel bolts and studs must conform to ASTM A193/A193M, Grade 8.
- C. Nuts: TP 316 stainless steel nuts must conform to ASTM F593, Grade A, hex style, hot-dipped galvanized. Stainless steel nuts must conform to ASTM A194/A194M, Grade 8.
- D. Washers: Provide flat circular washers under each bolt head and each nut. Washer materials must be the same as the connecting bolt and nut. Stainless steel washers must conform to ASTM A194/A194M, Grade 8.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. General:
 - 1. All piping, tank, and equipment shall be properly installed in accordance with the manufacturer's recommendations.
 - 2. Installation shall comply with the requirements set forth in NFPA 30 and NFPA 31.
 - 3. No work of any kind shall be undertaken until all necessary materials are available at the job site for this project.

- B. Protection of Materials and Equipment: Pipe and tank openings shall be closed with caps or plugs during installation. Equipment shall be tightly covered and protected against entry of dirt, water and chemical or mechanical injury.
- C. Pipe Installation
 - 1. General: Piping system shall be stainless steel. Piping connections to equipment shall be as required by equipment manufacturer. Threaded or mechanical joints shall be allowed at termination points of product carrying lines only. When work is not in progress, close open ends of pipe and fittings so that foreign substances cannot enter. Replace pipe, fittings, or appurtenances found defective after installation. Make threaded joints with tapered threads and make tight with joint compound; compatible with intended petroleum products, applied to male threads only.
 - 2. Handle pipe and accessories to ensure sound, undamaged condition. Piping shall be free of traps.
 - 3. Fuel piping shall be pressure tested, inspected and approved by the Engineer.
 - 4. All threaded joints shall be made liquid tight with suitable sealant.
 - 5. All piping shall be inspected inside and out before installation and no obstructions shall be allowed. Pipe ends shall be taper reamed to full I.D. and all burrs removed.
- D. The Contractor shall fill the tank with the appropriate fuel. After all tests and inspections have been conducted, the Contractor shall refill the tank prior to final acceptance.
- E. Dispensing System: Install dispensing systems per manufacturer's written instructions.
- F. AST Fill System: Install AST fill system per manufacturer's written instructions.

3.02 ELECTRICAL WORK

- A. Provide switches and devices required for controlling electrical equipment. Electrical installations shall conform to requirements of NFPA 70.

3.03 PIPE SUPPORTS

- A. Install supports for all piping to provide for expansion and contraction, prevent vibration and maintain required grading by proper adjustment.
- B. Field verify type of construction from which piping and/or equipment is to be supported.
- C. Pipes shall be supported at all elbows, branches and ends.
- D. Grind and smooth all sharp metal edges including struts and fabricated metal supports. Install end caps on the ends of all struts.

3.04 TESTING AND INSPECTION

- A. Contractor shall furnish all labor, equipment and instruments for tests and any required retests and pay for all cost of repairing any damage resulting from such tests. Contractor shall adjust systems until they are approved. Tests shall be performed in the presence of, and to the satisfaction of the Engineer. Qualified manufacturer's representatives shall conduct all tests and inspections for the tank piping, dispensers, and fill port system.

- B. The Contractor shall notify the Engineer no less than seven (7) days in advance of any equipment testing so that arrangements can be made to monitor the equipment tests.
- C. Aboveground Storage Tank Tightness Tests: Perform tightness tests on each aboveground storage tank prior to making piping connections. Perform testing in accordance with STI 700-50-5007 (STI R912) except as modified herein. Gauges used to monitor the tests must have a scale with a maximum limit of 15 psig. Repair leaks discovered during the tightness tests in accordance with tank manufacturer's instructions. Following any repair, re-test the tank until the tank successfully passes the testing requirements of this paragraph.
- D. Aboveground Storage Tank Manufacturer's tests: In addition to the tests required herein, perform any additional tests that is required by the tank manufacturer's written test procedures. Manufacturer's tests that are redundant to tests already required by this specification will only be performed once per tank. Repair all leaks discovered during the tests in accordance with manufacturer's instructions. Following tank repairs, re-test the tank until the tank successfully passes the manufacturer's testing requirements.
- E. Tank fill tests: Initially fill each storage tank with fuel in order to verify the tank level alarm system operates properly. Drain the system below the low liquid level setpoint to verify operation of the low-level alarm. Correct and retest any problems with the level alarm system until it operates as specified herein. During the tests, verify that all tank gauges are calibrated and operating appropriately.
- F. Aboveground Storage Tank Inspection: It is the contractor's responsibility to provide an STI SP001 certified inspector who must inspect the completed aboveground tanks in accordance with STI SP001 and deliver a full report to the Engineer. The report must include the tank data plate information and photograph of the tank data plate. The paper and electronic copies of the report must be provided to the Engineer for filing with the tanks' "As-Built" drawings as delineated in Section 01770 Closeout Procedures.

3.05 FLUSHING AND OPERATIONAL TEST

- A. Do not install dispensing units during flushing and cleaning of piping. Install temporary piping or hose equipped with a strainer having not less than 40-mesh screen between supply pipe and tank fill connection on tank from which fuel is being pumped. Furnish temporary pump for flushing. Flush each dispensing system with same type of fuel intended for use in system until outflowing fuel is "clean" and "bright": clean means absence of sediment or emulsion; bright refers to fluorescent appearance of fuel that has no cloud or haze. Test each system to demonstrate performance requirements for which it was designed. Test shall include unloading fuel trucks to demonstrate effectiveness of fill port system. Operate fuel dispensing equipment to demonstrate capability of fuel pumps to deliver desired flow and draw storage tank contents to level of pump inlet. When a portion of each system or a piece of equipment fails to pass tests, make repairs or adjustments and repeat test until satisfactory performance is achieved. Tests shall be witnessed by the Engineer, and the Contractor shall notify the Engineer a minimum of seven (7) days before testing. Furnish calibrated instruments and equipment, as well as the fuel, required to clean and flush each system and to conduct tests. Replace filters Upon completion of tests.

3.07 FUEL DISPENSERS

- A. Test the dispensing units per the manufacturer's recommendations.

3.08 ABOVE GROUND STORAGE TANK (AST) FILL PORT SYSTEM

- A. Test the AST fill port system per the manufacturer's recommendations,

3.09 PROTECTION

- A. Provide planking, plastic sheeting, or other protective covering as required to prevent damage during construction to existing building elements and equipment. Damage to materials, equipment or building due to the Contractor's neglect shall be repaired or replaced to the satisfaction of the Engineer by, and at the expense of, the Contractor. Be prepared to immediately repair any damage that does occur during any operations, so as to avoid damage to building or contents or interruption of State's operations.

3.10 INSPECTION

- A. Acceptance of the work will not take place until after discrepancies noted by the Engineer have been corrected to the satisfaction of the Engineer.

3.11 TECHNICAL SUPPORT

- A. The fuel systems equipment supplier shall be staffed with factory trained representatives fully capable of providing instruction on routine and emergency maintenance service on all system components supplied for this project.
- B. Suppliers shall provide on-site instruction, when requested by the Contractor or the Engineer, at no additional cost to the State.

3.12 USER TRAINING SESSION

- A. Contractor shall provide a minimum of four (4) hours of training for user personnel. Training shall be given by the equipment manufacturer's representative. Schedule training a minimum of fourteen (14) calendar days in advance.

3.13 CLEAN UP

- A. Upon completion of this work, remove all debris and excess materials, tools, etc. resulting from this work from the job site and leave the location of this work broom-clean in an acceptable manner as approved by the Engineer. All fuel system equipment shall be thoroughly cleaned and ready for use.

PART 4 - MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

- A. All work specified in this section shall not be measured nor paid for separately but shall be considered incidental to Bid Item No. 4 – Fueling Systems, of the Proposal and Proposal Schedule.

END OF SECTION

DIVISION 16 - ELECTRICAL

SECTION 16011 - GENERAL ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

- A. This section specifies the general electrical requirements for all labor, materials, equipment, and services provided under DIVISION 16 – ELECTRICAL.
- B. Work specified in this Division shall include, but not be limited to the following:
 - 1. Complete electrical system wiring including branch circuits, luminaires, switches, receptacles, outlets and control devices.
 - 2. Power wiring for electrically-operated equipment and appliances.
 - 3. Raceway system for telecommunications/data, systems.
 - 4. Testing.
 - 5. Record drawings.
- C. Related Sections include the following:
 - 1. DIVISION 1 – GENERAL REQUIREMENTS.
 - 2. DIVISION 2 – SITE CONSTRUCTION.
 - 3. DIVISION 15 – MECHANICAL.

1.02 WORK INCLUDED

- A. The Contractor under this Division shall provide all labor, materials, equipment, supervision and services required for the construction of the electrical systems. The finished installations shall be complete, operable and shall include all work specified herein and shown on the Drawings.
- B. The work shall include complete testing of all equipment and wiring at the completion of the work and making any minor connection changes or adjustments necessary for the proper functioning of the system and equipment. All systems shall be properly adjusted and in working order at the time of final acceptance.
- C. Electrical equipment and wiring system shall have sufficient capacity to accommodate all equipment, appliances and other electrical loads as specified herein and shown on the drawings and as required per National Electrical Code and other applicable codes, standards and requirements plus spare capacity to accommodate any planned future facilities and additions and minimum 20 percent spare capacity for future growth.
- D. It is the intent of these Specifications and other Contract Documents to require an installation complete in every detail. Consequently, the Contractor will be responsible for minor details or for any special construction which may be found necessary to properly

furnish, install, adjust, test, and place in successful and continuous operation, the entire electrical system and the cost of same shall be included in the contract price.

1.03 REFERENCES

- A. The publications listed herein form a part of this specification to the extent referenced. The publications may be referred to in the text by the basic designation only. Unless otherwise indicated, the most recent edition of the publication with current revisions and amendments will be enforced.
- B. Comply with the applicable State Code Rules and the ordinances of the County having jurisdiction over this project.
- C. In the event of conflict between pertinent codes and regulations, and the requirements of the referenced standards, or those indicated in Specifications and on drawings, the provisions of the more stringent shall govern.

1.04 DEFINITIONS

- A. Unless otherwise specified or indicated, electrical and electronics terms used in these specifications, and on the drawings, shall be as defined in IEEE 100.
- B. The technical sections referred to herein are those specification sections that describe products, installation procedures, and equipment operations and that refer to this section for detailed description of submittal types.
- C. The technical paragraphs referred to herein are those paragraphs in PART 2 - PRODUCTS and PART 3 - EXECUTION of the technical sections that describe products, systems, installation procedures, equipment, and test methods.

1.05 SUBMITTALS

- A. Submit in accordance with Section 01330 Submittal Procedures.
- B. Certificates:
 - 1. Submit written certification that electrical systems are complete and operational as stipulated in item entitled "DEMONSTRATION OF COMPLETE ELECTRICAL SYSTEMS" hereinbelow.
 - 2. Submit certificate of final inspection and acceptance as stipulated in item entitled "INSPECTION" hereinbelow.
- C. Warranty: Submit warranty as stipulated in item entitled "WARRANTY" hereinbelow.
- D. Record Drawings: After the work is complete, Contractor shall provide record drawings showing the as-built conditions in accordance with Section 01770 Closeout Procedures.
- E. Submittals required in the sections which refer to this section shall conform to the following additional requirements. Submittals shall include the manufacturer's name, trade name, place of manufacture, catalog model or number, nameplate data, size, layout dimensions, capacity, project specification and technical paragraph reference. Submittals shall also include applicable industry and technical society publication references, and years of satisfactory service, and other information necessary to establish contract compliance of each item to be provided. Photographs of existing installations

are unacceptable and will be returned without approval. Transmittal letter shall include a listing of all items by manufacturer and catalog number which are included in the submittal package and shall clearly identify the submittal with this project.

- F. Submittals for each manufactured item shall be current manufacturer's descriptive literature of cataloged products, equipment drawings, diagrams, performance and characteristic curves, and catalog cuts. Handwritten and typed modifications and other notations not part of the manufacturer's preprinted data may result in the rejection of the submittal. Should manufacturer's data require supplemental information for clarification, the supplemental information shall be submitted as specified for certificates of compliance.
- G. Submittal drawings shall be a minimum of 11 inches by 17 inches in size using a minimum scale of 1/8 inch per foot, except as specified otherwise. Include wiring diagrams and installation details of equipment indicating proposed location, layout and arrangement, control panels, accessories, piping, ductwork, and other items that must be shown to ensure a coordinated installation. Wiring diagrams shall identify circuit terminals and indicate the internal wiring for each item of equipment and the interconnection between each item of equipment. Drawings shall indicate adequate clearance for operation, maintenance, and replacement of operating equipment devices.
- H. Where installation procedures or part of the installation procedures are required to be in accordance with manufacturer's instructions, submit printed copies of those instructions prior to installation. Installation of the item shall not proceed until manufacturer's instructions are received. Failure to submit manufacturer's instructions shall be cause for rejection of the equipment or material.
- I. Submit manufacturer's certifications as required for products, materials, finishes, and equipment as specified in the technical sections. Certificates from material suppliers are not acceptable. Preprinted certifications and copies of previously submitted documents will not be acceptable. The manufacturer's certifications shall name the appropriate products, equipment, or materials and the publication specified as controlling the quality of that item. Certification shall not contain statements to imply that the item does not meet requirements specified, such as "as good as"; "achieve the same end use and results as materials formulated in accordance with the referenced publications"; or "equal or exceed the service and performance of the specified material." Certifications shall simply state that the item conforms to the requirements specified. Certificates shall be printed on the manufacturer's letterhead and shall be signed by the manufacturer's official authorized to sign certificates of compliance.
- J. Where equipment or materials are specified to conform to industry and technical society reference standards of organizations such as American National Standards Institute (ANSI), American Society for Testing and Materials (ASTM), National Electrical Manufacturers Association (NEMA), and Underwriters Laboratories Inc. (UL), submit proof of such compliance. The label or listing by the specified organization will be acceptable evidence of compliance.
- K. In lieu of the label or listing, submit a certificate from an independent testing organization, competent to perform testing. The certificate shall state that the item has been tested in accordance with the specified organization's test methods and that the item complies with the specified organization's reference standard.

- L. Submit text of posted operating instructions for each system and principal item of equipment as specified in the technical sections.
- M. Each submittal shall be prepared with a summary sheet attached to each copy identifying all items included in the submittal. Incomplete submittals and those without summary sheets will be returned without review.

1.06 QUALITY ASSURANCE

- A. In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the Contracting Officer. 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.
- B. Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where 2 or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in the technical section.
- C. Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.
- D. Products manufactured more than 3 years prior to date of delivery to site shall not be used, unless specified otherwise.
- E. Equipment, materials, installation, and workmanship shall be in accordance with the mandatory and advisory provisions of NFPA 70.

1.07 PERMITS AND INSPECTION

- A. All permits required by local ordinances shall be obtained and paid for by the Contractor.

1.08 COORDINATION

- A. Refer to all project Drawings and to all Sections of the project Specifications. Coordinate and fit all work accordingly so that all electrical outlets and equipment will be properly located and readily accessible. The Drawings indicate the relation of wiring and connections and must not be scaled for exact locations. Verify all construction dimensions at the project and make changes necessary to conform to the building as constructed. Work improperly installed due to lack of construction verification shall be corrected at the Contractor's expense.
- B. Work shall be scheduled to avoid delays, interferences, and unnecessary work. If any conflicts occur, necessitating departures from the Drawings and Specifications, details of

departures and reasons therefore shall be submitted immediately for consideration by the Contracting Officer.

1.09 DELIVERY, HANDLING AND STORAGE

- A. Deliver all materials of this Division in manufacturer's original unopened packages or containers with label intact and legible.
- B. Use means necessary to protect the materials of this section before, during and after installation; to protect the installed work and materials of all other trades; and to protect the original structure, work and materials of the State.
- C. In the event of damage, immediately make all repairs and replacements necessary to the acceptance of the Contracting Officer and at no additional cost to the State.

1.10 DRAWINGS AND SPECIFICATIONS

- A. Electrical system drawings are diagrammatic and symbolic. Locations of outlets, devices, raceways, apparatus, etc., shown are approximate and shall be installed with the required maintenance and code clearances and to avoid conflict with other systems and trades. Visit site and verify lineal footages required and check scales and dimensions shown on architectural drawings prior to bidding to verify locations, routing and lineal footages of electrical work required for inclusion into bid. Study the project drawings and specifications, and make installation in most logical manner for eye appeal and coordination with other systems and trades. Unless dimensioned or noted otherwise, orderly configuration and visual composition are fully intended.
- B. Include additional components and wiring which are not shown or specified herein but are required for proper control and operation to provide for a complete and operable system within intent indicated on the drawings and specifications.
- C. Study the project drawings and specifications prior to bidding and provide additional wiring including apparatus and devices for equipment furnished by others without additional cost.
- D. Relocate devices, fixtures, apparatus and associated wiring including raceways, within 10 feet of the original location, without additional cost, for code compliance and to avoid conflict with other systems or trades, structures, utilities and when directed before installation.
- E. Equipment ratings or wire sizes that are missing or shown in error shall be provided to have adequate capacity to serve the required and future loads plus minimum 20 percent spare capacity, and be in compliance with NEC.
- F. Verify voltages and other ratings of energy conversion, transformation and electrical utilization equipment prior to placing order with factory. Input voltages of equipment shall match serving utility or system voltage available.

1.11 POSTED OPERATING INSTRUCTIONS

- A. Provide for each system and principal item of equipment as specified in the technical sections for use by operation and maintenance personnel. The operating instructions shall include the following:
 - 1. Wiring diagrams, control diagrams, and control sequence for each principal system and item of equipment.
 - 2. Start up, proper adjustment, operating, lubrication, and shutdown procedures.
 - 3. Safety precautions.
 - 4. The procedure in the event of equipment failure.
 - 5. Other items of instruction as recommended by the manufacturer of each system or item of equipment.
- B. Print or engrave operating instructions and frame under glass or in approved laminated plastic. Post instructions where directed. For operating instructions exposed to the weather, provide weather-resistant materials or weatherproof enclosures. Operating instructions shall not fade when exposed to sunlight and shall be secured to prevent easy removal or peeling.

1.12 MANUFACTURER'S NAMEPLATE

- A. Each item of equipment shall have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

1.13 FIELD FABRICATED NAMEPLATES

- A. ASTM D709. Provide laminated plastic nameplates for each equipment enclosure, relay, switch, and device; as specified in the technical sections or as indicated on the drawings. Each nameplate inscription shall identify the function and, when applicable, the position. Nameplates shall be melamine plastic, 0.125 inch thick, white, with black center core. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core. Minimum size of nameplates shall be one inch by 2.5 inches. Lettering shall be a minimum of 0.25 inch high normal block style.

1.14 WARNING SIGNS

- A. Provide warning signs/labels for arc flash protection in accordance with NFPA 70E and NEMA Z535.4 for switchboards, panelboards, industrial control panels, and motor control centers that are in other than dwelling occupancies and are likely to require examination, adjustment, servicing, or maintenance while energized. Provide field installed signs/labels to warn qualified persons of potential electric arc flash hazards when warning signs/labels are not provided by the manufacturer. The marking shall be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.

1.15 ELECTRICAL REQUIREMENTS

- A. Electrical installation shall conform to IEEE C2, NFPA 70, and requirements specified herein.

1.16 INSTRUCTION TO GOVERNMENT PERSONNEL

- A. Where specified in the technical sections, furnish the services of competent instructors to give full instruction to designated Government personnel in the adjustment, operation, and maintenance of the specified systems and equipment, including pertinent safety requirements as required. Instructors shall be thoroughly familiar with all parts of the installation and shall be trained in operating theory as well as practical operation and maintenance work. Instruction shall be given during the first regular work week after the equipment or system has been accepted and turned over to the Government for regular operation. The number of man-days (8 hours per day) of instruction furnished shall be as specified in the individual section.

1.17 WARRANTY

- A. Contractor's Warranty: Installation shall be complete in every detail as specified and ready for use. Unless otherwise indicated, any items supplied by Contractor developing defects of design, construction, or quality within ONE year of final acceptance by Contracting Officer shall be replaced by such new materials, apparatus or parts to make such defective portion of the complete system conform to the true intent and meaning of the Drawings and Specifications at no additional cost to the State. Lamps shall be warranted for fifty percent of rated lamp life.
- B. The Contractor's Warranty shall be countersigned by the General Contractor.

PART 2 - PRODUCTS

2.01 FACTORY APPLIED FINISH

- A. Electrical equipment shall have factory-applied painting systems which shall, as a minimum, meet the requirements of NEMA 250 corrosion-resistance test.

PART 3 - EXECUTION

3.01 GENERAL

- A. Install all electrical materials and equipment in accordance with manufacturer's recommendations and as accepted by the Contracting Officer for the seismic zone classification at the project site in accordance with the applicable Building Code.
- B. Cut, break, drill and patch as required, to install electrical system. Repair any surface damaged or marred by notching, drilling or any other process necessary for installation of electrical work. Patch any damaged surfaces to match the existing surface.
- C. All wiring and overcurrent devices for equipment furnished by other trades are sized for a contemplated equipment size. If equipment other than contemplated and indicated on the plan is provided, the Contractor shall be responsible for providing the required wiring, switches, and overcurrent devices at no cost to the State. The Contractor shall submit the proposed revisions to the electrical design to the Contracting Officer for acceptance.
- D. The Electrical Contractor shall coordinate his work with other trades to avoid conflicts with civil, mechanical, structural, and architectural elements of this project.

3.02 JOBSITE CONDITIONS

- A. These specifications are accompanied by construction drawings including building and site plans of all trades showing locations of all feeder runs, outlets, devices, and other electrical equipment. The locations are approximate and before installing, study adjacent architectural details and make installation in most logical manner. Any device may be relocated within 10 feet before installation at the direction of the Contracting Officer without additional cost to the State.
- B. Before installing, verify all dimensions and sizes of equipment.
- C. Verify that electrical system may be installed in strict accordance with the original design, the Drawings and Specifications and the manufacturer's recommendations.
- D. In the event of discrepancy, immediately notify the Contracting Officer. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

3.03 CONNECTIONS TO EQUIPMENT PROVIDED BY OTHER TRADES

- A. Electrical Contractor shall provide conduit, wiring and all electrical connections from building wiring to motors for ventilation, air conditioning, and other equipment, including all switches, motor protection devices, and controllers/starters as specified by other trades.
- B. Electrical Contractor shall ascertain from other trades furnishing electrically-operated equipment, the exact size and type of all motors and other loads, the exact locations of such equipment and the proper point where electrical connections should be brought through the floors, ceiling or walls, as the case may be. Locations shown are diagrammatic only; coordination of the correct locations shall be the full responsibility of the Electrical Contractor.
- C. Examine Civil, Mechanical, Architectural, Structural and other Drawings and Specifications for information concerning electrically-operated equipment and control apparatus and diagrams.
- D. Install individually mounted controllers/starters furnished for motors under other Divisions. Provide and install safety switches as necessary for each such motor in accordance with the NEC.
- E. All control devices and control wiring shall be provided as described in the installation manuals of equipment and/or the Drawings and Specifications of other trades and disciplines.

3.04 FIELD APPLIED PAINTING

- A. Prime and paint all exposed raceways, boxes, fittings, support channels, mounting hardware, and accessories to match finish of adjacent surfaces. Paint electrical equipment as required to match finish of adjacent surfaces or to meet the indicated or specified safety criteria. Painting shall be as specified in the section specifying the associated electrical equipment.

3.05 FIELD FABRICATED NAMEPLATE MOUNTING

- A. Provide number, location, and letter designation of nameplates as indicated. Fasten nameplates to the device with a minimum of 2 sheet-metal screws or 2 rivets.

3.06 DEMONSTRATION OF COMPLETE ELECTRICAL SYSTEMS

- A. Submit written certification that electrical systems are complete and operational. Submit certification with Contractor's request for final review.
- B. At the time of final review of electrical work, demonstrate the operation of electrical systems. Provide labor, apparatus and equipment for systems' demonstration. The various tests shall be under the direction and supervision of the Contracting Officer.
- C. The Contractor shall provide all test equipment, materials, labor, and temporary power hook-ups to perform start-up and all tests as required, to obtain final field acceptance from the State. All tests shall be conducted in the presence of the Contracting Officer or his representative. All test procedures shall conform to this specification and applicable standards. (ANSI, IEEE, NEMA, OSHA, NFPA, NETA, etc.)
- D. The Contractor shall be responsible for all tests and test record. Testing shall be performed by and under the immediate supervision of the Contractor. Test record shall be kept for each piece of equipment. Copies shall be furnished to the Contracting Officer for his review and/or acceptance.
- E. A visual inspection of all electrical equipment, to check for foreign material, tightness or wiring and connection, proper grounding, matching nameplate charts with specification, etc., shall be made prior to actual testing.
- F. After demonstration of systems, submit to the Contracting Officer 6 sets of keys for electrical equipment locks.

3.07 INSPECTION

- A. Arrange for periodic inspection by the local authorities and deliver the certificate of final inspection to the Contracting Officer.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

- A. All work specified in this section shall not be measured nor paid for separately but shall be considered incidental to Bid Item No. 5 – Electrical Work, of the Proposal and Proposal Schedule.

END OF SECTION

SECTION 16100 - ELECTRICAL WORK

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes, but is not limited to, electrical systems as indicated in the drawings.
- B. Related Sections include the following:
 - 1. Section 16011 – General Electrical Requirements.

1.02 REFERENCES

- A. The publications listed herein form a part of this specification to the extent referenced. The publications may be referred to in the text by the basic designation only. Unless otherwise indicated, the most recent edition of the publication with current revisions and amendments will be enforced.

1.03 SUBMITTALS

- A. Submit in accordance with Section 01330 Submittal Procedures and Section 16011 General Electrical Requirements.
- B. Submit shop drawings and catalog cuts of the following equipment for approval. Each submittal shall be prepared with a summary sheet attached to each copy identifying all items included in the submittal. Incomplete submittals and those without summary sheets will be returned without review.
- C. Manufacturer's Catalog Data:
 - 1. Panelboards.
 - 2. Overcurrent protection devices.
 - 3. Emergency Fuel Shut Off (EFSO) Buttons.
- D. Shop Drawings:
 - 1. Panelboards.
- E. Reports: Submit test results for approval in report form:
 - 1. 600 volt wiring test.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements: In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" or "must" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the Contracting Officer. Provide equipment, materials, installation, and workmanship in accordance with the mandatory and advisory provisions of NFPA 70 unless more stringent requirements are specified or indicated.
- B. Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship.

Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where 2 or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in this section.

- C. Alternative Qualifications: Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6,000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.
- D. Material and Equipment Manufacturing Date: Products manufactured more than 3 years prior to date of delivery to site shall not be used, unless specified otherwise.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Materials shall be new and those items listed by the Underwriters' Laboratories shall bear "UL" label of approval.
- B. Brand names, manufacturer's names and catalog numbers indicate the standard of design and quality required. Acceptable manufacturers for electrical apparatus include General Electric, Square D, Siemens-ITE, and Cutler-Hammer. All apparatus supplied shall bear the name of the approved manufacturer on its nameplates. Substitute materials may be used if pre-qualified prior to bidding by the Contracting Officer.
- C. Electrical equipment and luminaires shall be supplied through the manufacturer's designated representative by a local distributor.
- D. Proof of compliance shall be furnished when shop drawings are submitted.
- E. Where 2 or more similar type items are furnished, all shall be of the same manufacture, e.g., safety switches shall be of the same manufacturer unless otherwise noted.
- F. Where electrical apparatus is to be installed outdoors, NEMA 4X stainless steel housings shall be provided, unless noted otherwise.

2.02 RACEWAYS

- A. Rigid Steel Conduit: Rigid steel, zinc-coated inside and outside, for use with threaded fittings. ANSI C80.1.
- B. Intermediate Metal Conduit (IMC): Rigid steel, zinc- and chromate-coated inside and outside, for use with threaded fittings. UL 1242.
- C. Electrical Metal Tubing (EMT): Thin-walled steel tubing, zinc-coated. ANSI C80.3.

- D. Flexible Metal Conduit: Flexible steel conduit; zinc-coated inside and outside, smooth inside walls, liquid-tight with factory fittings for liquid-tight installation. Provide bushings with bonding jumper lugs for flexible conduit in excess of 6 feet in length. UL 360.
- E. Fittings for Metal Conduit, EMT, and Flexible Metal Conduit: UL 514B. Ferrous fittings shall be cadmium- or zinc-coated in accordance with UL 514B.
- F. Fittings for Rigid Metal Conduit and IMC: Threaded-type. Split couplings unacceptable.
- G. Fittings for EMT: Steel compression type.

2.03 OUTLET BOXES AND COVERS

- A. Outlet and Small Junction Boxes: UL 514A, galvanized, if ferrous metal. UL 514C, if nonmetallic.
 - 1. Nominal 4 inches square, 2-1/8 inches deep exclusive of plaster ring, pressed steel.
 - 2. Mount outlet boxes flush in finished walls.
 - 3. Surface mounted boxes and boxes exposed to the weather shall be cast steel, type FD, prime painted and enamel finished with neoprene gasketed covers, threaded hubs for conduit connections and stainless steel screws.

2.04 CABINETS, JUNCTION BOXES, AND PULL BOXES

- A. Volume greater than 100 cubic inches, UL 50, hot-dip, zinc-coated, if sheet steel.

2.05 WIRES AND CABLES

- A. Wires and cables shall meet applicable requirements of NFPA 70 and UL for type of insulation, jacket, and conductor specified or indicated. Wires and cables manufactured more than 12 months prior to date of delivery to site shall not be used.
- B. Conductors:
 - 1. Conductors No. 8 AWG and larger diameter shall be stranded.
 - 2. Conductors No. 10 AWG and smaller diameter shall be solid.
 - 3. Conductors for remote control, alarm, and signal circuits, classes 1, 2, and 3, shall be stranded unless specifically indicated otherwise.
 - 4. Conductor sizes and capacities shown are based on copper, unless indicated otherwise. All conductors shall be copper.
 - 5. Equipment Manufacturer Requirements: When manufacturer's equipment requires copper conductors at the terminations or requires copper conductors to be provided between components of equipment, provide copper conductors or splices, splice boxes, and other work required to satisfy manufacturer's requirements.
 - 6. Minimum Conductor Sizes:
 - a. Minimum size for branch circuits shall be No. 12 AWG.
 - b. Class 1 remote-control and signal circuits: No. 14 AWG.

- c. Class 2 low-energy, remote-control and signal circuits: No. 16 AWG.
 - d. Class 3 low-energy, remote-control, alarm and signal circuits: No. 22 AWG.
- C. Color Coding: Provide for service, feeder, branch, control, and signaling circuit conductors.
- 1. Color shall be green for grounding conductors and white for neutrals; except where neutrals of more than one system are installed in same raceway or box, other neutrals shall be white with a different colored (not green) stripe for each.
 - 2. Color of ungrounded conductors in different voltage systems shall be as follows:
 - a. 208/120 volt, 3-phase:
 - 1) Phase A - black.
 - 2) Phase B - red.
 - 3) Phase C - blue.
- D. Insulation: Unless specified or indicated otherwise or required by NFPA 70, power and lighting wires shall be 600-volt, Type THWN/THHN conforming to UL 83 or Type[XHHW or RHW conforming to UL 44, except that grounding wire may be type TW conforming to UL 83; remote-control and signal circuits shall be Type TW or TF, conforming to UL 83. Where lighting fixtures require 90-degree Centigrade (C) conductors, provide only conductors with 90-degree C insulation or better.
- E. Bonding Conductors: ASTM B1, solid bare copper wire for sizes No. 8 AWG and smaller diameter; ASTM B8, Class B, stranded bare copper wire for sizes No. 6 AWG and larger diameter.

2.06 SPLICES AND TERMINATION COMPONENTS

- A. UL 486A-486B for wire connectors and UL 510 for insulating tapes. Connectors for No. 10 AWG and smaller diameter wires shall be insulated, pressure-type in accordance with UL 486A-486B or UL 486C (twist-on splicing connector). Provide solderless terminal lugs on stranded conductors.

2.07 EMERGENCY FUEL SHUT OFF BUTTONS

- A. Provide EFSO pushbuttons as indicated. Pushbuttons shall be equipped with large mushroom head. Each pushbutton shall include signage at eye level with large letters that indicate the function of the EFSO switches. Industrial grade. Rated for outdoor use.

2.08 PANELBOARDS

- A. Provide panelboards in accordance with the following:
 - 1. UL 67 and UL 50 having a short-circuit current rating as indicated.
 - 2. Panelboards for use as service disconnecting means: additionally conform to UL 869A.
 - 3. Panelboards: Circuit breaker-equipped.

4. Designed such that individual breakers can be removed without disturbing adjacent units or without loosening or removing supplemental insulation supplied as means of obtaining clearances as required by UL.
 5. "Specific breaker placement" is required in panelboards to match the breaker placement indicated in the panelboard schedule on the drawings.
 6. Where "space only" or "PFB" is indicated, make provisions for future installation of breakers.
 7. Directories: Indicate load served by each circuit in panelboard.
 8. Directories: indicate source of service to panelboard (e.g., Panel PA served from Panel MDP).
 9. Provide new directories for existing panels modified by this project as indicated.
 10. Type directories and mount in holder behind transparent protective covering.
 11. Panelboards: Listed and labeled for their intended use.
 12. Panelboard nameplates: Provided in accordance with paragraph entitled "FIELD FABRICATED NAMEPLATES" hereinbelow.
- B. Enclosure: Provide panelboard enclosure in accordance with the following:
1. UL 50.
 2. Cabinets mounted outdoors or flush-mounted: Hot-dipped galvanized after fabrication.
 3. Cabinets: Painted in accordance with paragraph entitled "FIELD APPLIED PAINTING" hereinbelow.
 4. Front edges of cabinets: Form-flanged or fitted with structural shapes welded or riveted to the sheet steel, for supporting the panelboard front.
 5. All cabinets: Fabricated such that no part of any surface on the finished cabinet deviates from a true plane by more than 1/8 inch.
 6. Holes: Provided in the back of indoor surface-mounted cabinets, with outside spacers and inside stiffeners, for mounting the cabinets with a 1/2 inch clear space between the back of the cabinet and the wall surface.
 7. Flush doors: Mounted on hinges that expose only the hinge roll to view when the door is closed.
 8. Each door: Fitted with a combined catch and lock, except that doors over 24 inches long provided with a three-point latch having a knob with a T-handle, and a cylinder lock.

9. Keys: Two (2) provided with each lock, with all locks keyed alike.
 10. Finished-head cap screws: Provided for mounting the panelboard fronts on the cabinets.
- C. Panelboard Buses: Provide copper buses. Support bus bars on bases independent of circuit breakers. Main buses and back pans shall be designed so that breakers may be changed without machining, drilling, or tapping. Provide isolated neutral bus in each panel for connection of circuit neutral conductors. Provide separate ground bus identified as equipment grounding bus per UL 67 for connecting grounding conductors; bond to steel cabinet.
- D. Circuit Breakers: UL 489, thermal magnetic-type having a minimum short-circuit current rating equal to the short-circuit current rating of the panelboard in which the circuit breaker shall be mounted. Breaker terminals shall be UL listed as suitable for type of conductor provided. Where indicated on the drawings, provide circuit breakers with shunt trip devices. Series rated circuit breakers and plug-in circuit breakers are unacceptable.
1. Multipole Breakers: Provide common trip-type with single operating handle. Breaker design shall be such that overload in one pole automatically causes all poles to open. Maintain phase sequence throughout each panel so that any 3 adjacent breaker poles are connected to Phases A, B, and C, respectively.
 2. Circuit Breakers for HVAC Equipment: Circuit breakers for HVAC equipment having motors (group or individual) shall be marked for use with HACR type and UL listed as HACR type.

2.09 MOTORS

- A. Provide motors in accordance with the following:
1. NEMA MG 1.
 2. Hermetic-type sealed motor compressors shall also comply with UL 984.
 3. Provide the size in terms of HP or kVA, or full-load current, or a combination of these characteristics, and other characteristics, of each motor as indicated or specified.
 4. Determine specific motor characteristics to ensure provision of correctly sized starters and overload heaters.
 5. Motors for operation on 208-volt, 3-phase circuits shall have terminal voltage rating of 200 volts, and those for operation on 480-volt, 3-phase circuits shall have terminal voltage rating of 460 volts.
 6. Motors shall be designed to operate at full capacity with voltage variation of plus or minus 10 percent of motor voltage rating.
 7. Unless otherwise indicated, motors rated 1 HP and above shall be continuous duty type.
 8. Where fuse protection is specifically recommended by the equipment manufacturer, provide fused switches in lieu of non-fused switches indicated.

- B. High Efficiency Single-Phase Motors: Single-phase fractional-horsepower alternating-current motors shall be high efficiency types corresponding to the applications listed in NEMA MG 11. In exception, for motor-driven equipment with a minimum seasonal or overall efficiency rating, such as a SEER rating, provide equipment with motor to meet the overall system rating indicated.
- C. Premium Efficiency Polyphase Motors: Polyphase motors shall be selected based on high efficiency characteristics relative to typical characteristics and applications as listed in NEMA MG 10. In addition, continuous rated, polyphase squirrel-cage medium induction motors shall meet the requirements for premium efficiency electric motors in accordance with NEMA MG 1, including the NEMA full load efficiency ratings. In exception, for motor-driven equipment with a minimum seasonal or overall efficiency rating, such as a SEER rating, provide equipment with motor to meet the overall system rating indicated.
- D. Motor Sizes: Provide size for duty to be performed, not exceeding the full-load nameplate current rating when driven equipment is operated at specified capacity under most severe conditions likely to be encountered. When motor size provided differs from size indicated or specified, make adjustments to wiring, disconnect devices, and branch circuit protection to accommodate equipment actually provided. Provide controllers for motors rated 1 HP and above with electronic phase-voltage monitors designed to protect motors from phase-loss, undervoltage, and overvoltage. Provide protection for motors from immediate restart by a time adjustable restart relay.
- E. Wiring and Conduit: Provide internal wiring for components of packaged equipment as an integral part of the equipment. Provide power wiring and conduit for field-installed equipment as specified herein. Power wiring and conduit shall conform to the requirements specified herein. Control wiring shall be provided under and conform to the requirements of the section specifying the associated equipment.

2.10 MOTOR CONTROLLERS

- A. Provide motor controllers in accordance with the following:
 - 1. UL 508, NEMA ICS 1, and NEMA ICS 2.
 - 2. Controllers shall have thermal overload protection in each phase and shall have one spare normally open and one spare normally closed auxiliary contact.
 - 3. Provide controllers for motors rated 1HP and above or equipment containing such motorized components with electronic phase-voltage monitors designed to protect motors from phase-loss, undervoltage, and overvoltage.
 - 4. Provide protection for motors from immediate restart by a time adjustable restart relay.
 - 5. Magnetic-type motor controllers shall have undervoltage protection when used with momentary-contact pushbutton stations or switches and shall have undervoltage release when used with maintained-contact pushbutton stations or switches.
 - 6. When used with pressure, float, or similar automatic-type or maintained-contact switch, controller shall have hand/off/automatic selector switch.

7. Connections to selector switch shall be such that only normal automatic regulatory control devices are bypassed when switch is in "hand" position.
8. Safety control devices, such as low and high pressure cutouts, high temperature cutouts, and motor overload protective devices, shall be connected in motor control circuit in "hand" and "automatic" positions.
9. Control circuit connections to hand/off/automatic selector switch or to more than one automatic regulatory control device shall be made in accordance with indicated or manufacturer's approved wiring diagram.
10. For each motor not in sight of controller or where controller disconnecting means is not in sight of motor location and driven machinery location, controller disconnecting means shall be capable of being locked in open position. As an alternative, provide a manually operated, lockable, non-fused switch which disconnects motor from supply source within sight of motor.
11. Overload protective devices shall provide adequate protection to motor windings; be thermal inverse-time-limit type; and include manual reset-type pushbutton on outside of motor controller case.
12. Cover of combination motor controller and manual switch or circuit breaker shall be interlocked with operating handle of switch or circuit breaker so that cover cannot be opened unless handle of switch or circuit breaker is in "off" position.

B. Control Wiring:

1. Provide control wiring in accordance with the following:
 - a. All control wire shall be stranded tinned copper switchboard wire with 600-volt flame-retardant insulation Type SIS meeting UL 44, or Type MTW meeting UL 1063, and shall pass the VW-1 flame tests included in those standards.
 - b. Hinge wire shall have Class K stranding.
 - c. Current transformer secondary leads shall be not smaller than No. 10 AWG.
 - d. The minimum size of control wire shall be No. 14 AWG.
 - e. Power wiring for 480-volt circuits and below shall be of the same type as control wiring and the minimum size shall be No. 12 AWG.
 - f. Special attention shall be given to wiring and terminal arrangement on the terminal blocks to permit the individual conductors of each external cable to be terminated on adjacent terminal points.

C. Control Circuits:

1. Control circuits shall have maximum voltage of 120 volts derived from control transformer in same enclosure. Transformers shall conform to UL 506, as applicable. Transformers, other than transformers in bridge circuits, shall have primaries wound for voltage available and secondaries wound for correct control circuit voltage. Size transformers so that 80 percent of rated capacity equals connected load. Provide disconnect switch on primary side. Provide fuses in each

ungrounded primary feeder. One secondary lead shall be fused; other shall be grounded.

- D. Enclosures for Motor Controllers: NEMA ICS 6.
- E. Pushbutton Stations: Provide with "start/stop" momentary contacts having one normally open and one normally closed set of contacts, and red lights to indicate when motor is running. Stations shall be heavy duty, oil-tight design.
- F. Pilot and Indicating Lights: Provide LED cluster lamps.

2.11 LOCKOUT REQUIREMENTS

- A. Provide disconnecting means capable of being locked out for machines and other equipment to prevent unexpected startup or release of stored energy in accordance with 29 CFR 1910.147. Mechanical isolation of machines and other equipment shall be in accordance with requirements of DIVISION 15 - MECHANICAL.

2.12 TELECOMMUNICATIONS RACEWAY DISTRIBUTION SYSTEM

- A. Provide a system of telecommunications cable-supporting structures, including conduits with pull wires, terminal boxes, outlet and junction boxes, and other accessories as required, to complete the raceway system in accordance with TIA-569.
- B. Outlet Boxes for Telecommunications System: Provide standard type 4-11/16 inches square by 2-1/8 inches deep. Depth of boxes shall be large enough to allow manufacturers' recommended conductor bend radii.
- C. Cover Plates: Blank device cover plate of finish specified for receptacles and switch cover plates.
- D. Conduit Sizing: Unless otherwise indicated, conduit for single outlets shall be a minimum of one inch. Size conduits for horizontal distribution and risers to cabinets, junction boxes, distribution center, and telecommunications service, as indicated.

2.13 MANUFACTURER'S NAMEPLATE

- A. Each item of equipment shall have a nameplate bearing the manufacturer's name, address, model number, and serial number securely affixed in a conspicuous place; the nameplate of the distributing agent will not be acceptable.

2.14 FIELD FABRICATED NAMEPLATES

- A. Provide field fabricated nameplates in accordance with the following:
 1. ASTM D709.
 2. Provide laminated plastic nameplates for each equipment enclosure, relay, switch, and device; as specified or as indicated on the drawings.
 3. Each nameplate inscription shall identify the function and, when applicable, the position.
 4. Nameplates shall be melamine plastic, 0.125 inch thick, white with black center core.

5. Surface shall be matte finish. Corners shall be square. Accurately align lettering and engrave into the core.
6. Minimum size of nameplates shall be one inch by 2.5 inches.
7. Lettering shall be a minimum of 0.25 inch high normal block style.

2.15 WARNING SIGNS

- A. Provide warning signs for flash protection in accordance with NFPA 70E and NEMA Z535.4 for switchboards, panelboards, industrial control panels, and motor control centers that are in other than dwelling occupancies and are likely to require examination, adjustment, servicing, or maintenance while energized. Provide field installed signs to warn qualified persons of potential electric arc flash hazards when warning signs are not provided by the manufacturer. The marking shall be clearly visible to qualified persons before examination, adjustment, servicing, or maintenance of the equipment.

2.16 FIRESTOPPING MATERIALS

- A. Provide firestopping around electrical penetrations. Utilize UL-listed firestopping systems or assemblies suitable for the penetration being sealed.

2.17 FACTORY APPLIED FINISH

- A. Provide factory-applied finish on electrical equipment in accordance with the following:
 1. NEMA 250 corrosion-resistance test and the additional requirements as specified herein.
 2. Interior and exterior steel surfaces of equipment enclosures shall be thoroughly cleaned and then receive a rust-inhibitive phosphatizing or equivalent treatment prior to painting.
 3. Exterior surfaces shall be free from holes, seams, dents, weld marks, loose scale or other imperfections.
 4. Interior surfaces shall receive not less than one coat of corrosion-resisting paint in accordance with the manufacturer's standard practice.
 5. Exterior surfaces shall be primed, filled where necessary, and given not less than 2 coats baked enamel with semi-gloss finish.
 6. Equipment located indoors shall be ANSI Light Gray, and equipment located outdoors shall be ANSI Dark Gray.
 7. Provide manufacturer's coatings for touch-up work and as specified in paragraph entitled "FIELD APPLIED PAINTING" hereinbelow.

2.18 HARDWARE, SUPPORTS, BACKING, ETC.

- A. Provide all hardware, supports, backing and other accessories necessary to install electrical equipment. Wood materials shall be treated against termites, iron or steel materials shall be galvanized for corrosion protection, and non-ferrous materials shall be brass or bronze. Provide other specialty materials where indicated.

- B. Bolts, nuts, washers, and screws used for exterior use shall be high quality stainless steel or brass.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Electrical installations, including weatherproof and hazardous locations and ducts, plenums and other air-handling spaces, shall conform to requirements of NFPA 70 and IEEE C2 and to requirements specified herein.
- B. Hazardous Locations: Work in hazardous locations, as defined by NFPA 70, shall be performed in strict accordance with NFPA 70 for particular "Class," "Division," and "Group" of hazardous locations involved. Provide conduit and cable seals where required by NFPA 70. Conduit shall have tapered threads.
- C. Wiring Methods: Provide insulated conductors installed in rigid steel conduit, IMC, rigid nonmetallic conduit, or EMT, except where specifically indicated or specified otherwise or required by NFPA 70 to be installed otherwise. Utilize non-wax type lubricants for pulling, chemically neutral to insulation and sheath. Mechanical means for pulling to be tongue-limiting type and not be used for #2 AWG wires and smaller. Grounding conductor shall be separate from electrical system neutral conductor. Provide insulated green equipment grounding conductor for circuit(s) installed in conduit and raceways. Minimum conduit size shall be 3/4 inch in diameter for low voltage lighting and power circuits. Conduit which penetrates fire-rated walls, fire-rated partitions, or fire-rated floors shall be firestopped.
 - 1. Pull Wire: Install pull wires in empty conduits. Pull wire shall be plastic having minimum 200-pound force tensile strength. Leave minimum 36 inches of slack at each end of pull wire.
- D. Conduit Installation: Unless indicated otherwise, conceal conduit under floor slabs and within finished walls, ceilings, and floors. Keep conduit minimum 6 inches away from parallel runs of flues and steam or hot water pipes. Install conduit parallel with or at right angles to ceilings, walls, and structural members where located above accessible ceilings and where conduit will be visible after completion of project.
 - 1. Restrictions Applicable to EMT:
 - a. Do not install underground.
 - b. Do not encase in concrete, mortar, grout, or other cementitious materials.
 - c. Do not use in areas subject to severe physical damage including but not limited to equipment rooms where moving or replacing equipment could physically damage the EMT.
 - d. Do not use in hazardous areas.
 - e. Do not use outdoors, including under open-sided covered lanais, patios, walkways or other similar locations.
 - f. Do not use exposed below +8 feet above the finished floor, except in dedicated Electrical Rooms.

2. Restrictions Applicable to Flexible Conduit: Use only as specified in subparagraph entitled "Flexible Connections" hereinbelow.
3. Underground Conduit Other Than Service Entrance: Plastic-coated rigid steel; plastic-coated steel IMC; Schedule 40 PVC. Convert nonmetallic conduit to plastic-coated rigid, or IMC, steel conduit before rising through floor slab except where the nonmetallic conduit is concealed and located within walls up to the first outlet box or conduit coupling above the finished floor. Plastic coating on metallic conduits shall extend minimum 6 inches above floor.
4. Conduit Installed Under Floor Slabs: Conduit run under floor slab shall be located a minimum of 12 inches below the vapor barrier. Seal around conduits at penetrations thru vapor barrier.
5. Conduit through Floor Slabs: Where conduits rise through floor slabs, curved portion of bends shall not be visible above finished slab.
6. Conduit Installed in Concrete Slabs: Rigid steel; steel IMC; or Schedule 40 PVC. Locate so as not to adversely affect structural strength of slabs. Install conduit within middle one-third of concrete slab. Do not stack conduits. Space conduits horizontally not closer than 3 diameters, except at cabinet locations. Curved portions of bends shall not be visible above finish slab. Increase slab thickness as necessary to provide minimum one inch cover over conduit. Where embedded conduits cross building and/or expansion joints, provide suitable watertight expansion/deflection fittings and bonding jumpers. Expansion/deflection fittings shall allow horizontal and vertical movement of raceway. Conduit larger than one inch trade size shall be parallel with or at right angles to main reinforcement; when at right angles to reinforcement, conduit shall be close to one of supports of slab. Where nonmetallic conduit is used, raceway shall be converted to plastic-coated rigid steel or plastic-coated steel IMC before rising above floor, unless specifically indicated.
7. Stub-Ups: Provide conduits stubbed up through concrete floor for connection to free-standing equipment with adjustable top or coupling threaded inside for plugs, set flush with finished floor. Extend conductors to equipment in rigid steel conduit, except that flexible metal conduit may be used 6 inches above floor. Where no equipment connections are made, install screwdriver-operated threaded flush plugs in conduit end.
8. Conduit Support: Support conduit by pipe straps, wall brackets, hangers, or ceiling trapeze. Fasten by wood screws to wood; by toggle bolts on hollow masonry units; by concrete inserts or expansion bolts on concrete or brick; and by machine screws, welded threaded studs, or spring-tension clamps on steel work. Threaded C-clamps may be used on rigid steel conduit only. Do not weld conduits or pipe straps to steel structures. Plastic tie-wraps are not allowed for securing or supporting of electrical conduit. Load applied to fasteners shall not exceed 1/4 proof test load. Fasteners attached to concrete ceiling shall be vibration resistant and shock-resistant. Holes cut to depth of more than 1-1/2 inches in reinforced concrete beams or to depth of more than 3/4 inch in concrete joints shall not cut main reinforcing bars. Fill unused holes. In partitions of light steel construction, use sheet metal screws. In suspended-ceiling construction, run conduit above ceiling. Do not support conduit by ceiling support system. Conduit and box systems shall be supported independently

- of both (a) tie wires supporting ceiling grid system, and (b) ceiling grid system into which ceiling panels are placed. Supporting means shall not be shared between electrical raceways and mechanical piping or ducts. Installation shall be coordinated with above-ceiling mechanical systems to assure maximum accessibility to all systems. Spring-steel fasteners may be used for lighting branch circuit conduit supports in suspended ceilings in dry locations. Where conduit crosses building expansion joints, provide suitable expansion fitting that maintains conduit electrical continuity by bonding jumpers or other means. For conduits greater than 2-1/2 inches inside diameter, provide supports to resist forces of 0.5 times the equipment weight in any direction and 1.5 times the equipment weight in the downward direction.
9. **Directional Changes in Conduit Runs:** Make changes in direction of runs with symmetrical bends or cast-metal fittings. Make field-made bends and offsets with hickey or conduit-bending machine. Do not install crushed or deformed conduits. Avoid trapped conduits. Prevent plaster, dirt, or trash from lodging in conduits, boxes, fittings, and equipment during construction. Free clogged conduits of obstructions.
 10. **Locknuts and Bushings:** Fasten conduits to sheet metal boxes and cabinets with 2 locknuts where required by NFPA 70, where insulated bushings are used, and where bushings cannot be brought into firm contact with the box; otherwise, use at least minimum single locknut and bushing. Locknuts shall have sharp edges for digging into wall of metal enclosures. Install bushings on ends of conduits, and provide insulating type where required by NFPA 70. Provide threaded, weatherproof hubs for raceway connections to the top and sides of boxes and enclosures exposed to the weather. Utilize 2 weather-tight, sealing locknuts for penetrations to the bottom of such boxes.
 11. **Flexible Connections:** Provide flexible steel conduit between 3 feet and 6 feet in length for recessed and semi-recessed lighting fixtures for equipment subject to vibration, noise transmission, or movement; and for motors. Install flexible conduit to allow 20 percent slack. Minimum flexible steel conduit size shall be 1/2 inch diameter. Provide liquid-tight flexible conduit in wet and damp locations for equipment subject to vibration, noise transmission, movement or motors. Provide separate ground conductor across flexible connections.
- E. **Boxes, Outlets, and Supports:** Provide boxes in wiring and raceway systems wherever required for pulling of wires, making connections, and mounting of devices or fixtures. Boxes for metallic raceways shall be cast-metal, hub-type when located in wet locations, when surface mounted on outside of exterior surfaces, or when installed in hazardous areas and when specifically indicated. Boxes in other locations shall be sheet steel, except that nonmetallic boxes may be used with nonmetallic conduit system. Each box shall have volume required by NFPA 70 for number of conductors enclosed in box. Boxes for mounting lighting fixtures shall be minimum 4 inches square, or octagonal, except that smaller boxes may be installed as required by fixture configurations, as approved. Boxes for use in masonry-block or tile walls shall be square-cornered, tile-type, or standard boxes having square-cornered, tile-type covers. Provide gaskets for cast-metal boxes installed in wet locations and boxes installed flush with outside of exterior surfaces. Provide separate boxes for flush or recessed fixtures when required by fixture terminal operating temperature; fixtures shall be readily removable for access

to boxes unless ceiling access panels are provided. Support boxes and pendants for surface-mounted fixtures on suspended ceilings independently of ceiling supports. Fasten boxes and supports with wood screws on wood, with bolts and expansion shields on concrete or brick, with toggle bolts on hollow masonry units, and with machine screws or welded studs on steel. Threaded studs driven in by powder charge and provided with lockwashers and nuts may be used in lieu of wood screws, expansion shields, or machine screws. In open overhead spaces, cast boxes threaded to raceways need not be separately supported except where used for fixture support; support sheet metal boxes directly from building structure or by bar hangers. Where bar hangers are used, attach bar to raceways on opposite sides of box, and support raceway with approved-type fastener maximum 24 inches from box. When penetrating reinforced concrete members, avoid cutting reinforcing steel.

1. Pull Boxes: Construct of at least minimum size required by NFPA 70 of code-gauge galvanized sheet steel or stainless steel where indicated except where cast-metal boxes are required in locations specified herein. Provide boxes with screw-fastened covers. Where several feeders pass through common pull box, tag feeders to indicate clearly electrical characteristics, circuit number, and panel designation.
- F. Mounting Heights: Mount panelboards, circuit breakers, and disconnecting switches so height of any operating handle at its highest position is a maximum 78 inches above finished floor. Mount telecommunications outlets 18 inches above finished floor. Mount other devices as indicated. Measure mounting heights of wiring devices and outlets to center of device or outlet, unless otherwise indicated.
- G. Conductor Identification: Provide conductor identification within each enclosure where tap, splice, or termination is made. For conductors No. 6 AWG and smaller diameter, color coding shall be by factory-applied, color-impregnated insulation. For conductors No. 4 AWG and larger diameter, color coding shall be by plastic-coated, self-sticking markers; colored nylon cable ties and plates; or heat shrink-type sleeves. Identify control circuit terminations in accordance with manufacturer's recommendations.
- H. Splices: Make splices in accessible locations. Make splices in conductors No. 10 AWG and smaller diameter with insulated, pressure-type connector. Make splices in conductors No. 8 AWG and larger diameter with solderless connector, and cover with insulation material equivalent to conductor insulation.
- I. Covers and Device Plates: Install with edges in continuous contact with finished wall surfaces without use of mats or similar devices. Plaster fillings are not permitted. Install plates with alignment tolerance of 1/16 inch. Use of sectional-type device plates are not permitted. Provide gasket for plates installed in wet locations.
- J. Electrical Penetrations: Openings around electrical penetrations (such as conduit penetrations or flush mounted equipment enclosures or junctions boxes) through fire resistance-rated walls, partitions, floors, or ceilings shall be sealed to maintain fire resistive integrity. Use 3M CP25, Type MPP moldable putty or equivalent material or assemblies to maintain fire resistive integrity for conduit penetration and flush mounted outlet boxes. Use other approved construction methods for larger enclosures.
- K. Grounding and Bonding: Provide in accordance with NFPA 70. Ground exposed, non-current-carrying metallic parts of electrical equipment, metallic raceway systems,

grounding conductor in metallic and nonmetallic raceways, telecommunications system grounds, and neutral conductor of wiring systems.

- L. Equipment Connections: Provide power wiring for the connection of motors and control equipment under this section of the specification. Except as otherwise specifically noted or specified, automatic control wiring, control devices, and protective devices within the control circuitry are not included in this section of the specifications but shall be provided under the section specifying the associated equipment.
- M. Seismic Bracing: Contractor shall provide seismic bracing for all electrical equipment, apparatus, and raceways. Bracing shall, as a minimum, comply with the County Building Code.
- N. Repair of Existing Work: Repair of existing work, and modification of existing electrical distribution systems shall be performed as follows:
 - 1. Workmanship: Lay out work in advance. Exercise care where cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings, or other surfaces is necessary for proper installation, support, or anchorage of conduit, raceways, or other electrical work. Repair damage to buildings, piping, and equipment using skilled craftsmen of trades involved.
 - 2. Existing Concealed Wiring to be Removed: Existing concealed wiring to be removed shall be disconnected from its source. Remove conductors; cut conduit flush with floor, underside of floor, and through walls; and seal openings.

3.02 FIELD FABRICATED NAMEPLATE MOUNTING

- A. Provide number, location, and letter designation of nameplates as indicated. Fasten nameplates to the device with a minimum of 2 sheet-metal screws or 2 rivets.

3.03 WARNING SIGN MOUNTING

- A. Provide the number of signs required to be readable from each accessible side. Space the signs in accordance with NFPA 70E.

3.04 FIELD APPLIED PAINTING

- A. Paint electrical equipment as required to match finish of adjacent surfaces or to meet the indicated or specified safety criteria. Where field painting of enclosures for panelboards, load centers or the like is specified to match adjacent surfaces, to correct damage to the manufacturer's factory applied coatings, or to meet the indicated or specified safety criteria, provide manufacturer's recommended coatings and apply in accordance to manufacturer's instructions.

3.05 FIELD QUALITY CONTROL

- A. Furnish test equipment and personnel and submit written copies of test results. Give Contracting Officer 5 working days' notice prior to each test.
 - 1. Devices Subject to Manual Operation: Each device subject to manual operation shall be operated at least 5 times, demonstrating satisfactory operation each time.
 - 2. 600-Volt Wiring Test: Test wiring rated 600 volt and less to verify that no short circuits or accidental grounds exist. Perform insulation resistance tests on wiring No. 6 AWG and larger diameter using instrument which applies voltage of approximately

500 volts to provide direct reading of resistance. Minimum resistance shall be 250,000 ohms. Submit results to the Contracting Officer.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

All work specified in this section shall not be measured nor paid for separately but shall be considered incidental to Bid Item No. 5 – Electrical Work, of the Proposal and Proposal Schedule.

END OF SECTION

SECTION 16301 - UNDERGROUND ELECTRICAL WORK

PART 1 - GENERAL

1.01 SUMMARY

- A. This section includes, but is not limited to, the underground electrical infrastructure system. The underground infrastructure system includes the provision for electrical and telecommunications underground maintenance structures, ductlines, and conductors.
- B. Related Sections include the following:
 - 1. Section 16011 – General Electrical Requirements.

1.02 REFERENCES

- A. The publications listed herein form a part of this specification to the extent referenced. The publications may be referred to in the text by the basic designation only. Unless otherwise indicated, the most recent edition of the publication with current revisions and amendments will be enforced.

1.03 SUBMITTALS

- A. Submit in accordance with Section 01330 Submittal Procedures and Section 16011 General Electrical Requirements.
- B. Submit shop drawings and catalog cuts of the following equipment for approval. Each submittal shall be prepared with a summary sheet attached to each copy identifying all items included in the submittal. Incomplete submittals and those without summary sheets will be returned without review.
- C. Manufacturer's Catalog Data:
 - 1. Precast concrete structures.
 - 2. Sealing material.
 - 3. Handhole frames and covers.
 - 4. Manufacturer's directions for use of ground megger with proposed method indicated.
- D. Shop Drawings:
 - 1. Precast concrete structures.
 - 2. Handhole frames and covers.
- E. Reports: Test reports as required in the item entitled "FIELD QUALITY CONTROL" hereinbelow.

1.04 QUALITY ASSURANCE

- A. Regulatory Requirements: In each of the publications referred to herein, consider the advisory provisions to be mandatory, as though the word, "shall" or "must" had been substituted for "should" wherever it appears. Interpret references in these publications to the "authority having jurisdiction," or words of similar meaning, to mean the Contracting Officer. Provide equipment, materials, installation, and workmanship in accordance with

the mandatory and advisory provisions of NFPA 70 unless more stringent requirements are specified or indicated.

- B. Provide materials and equipment that are products of manufacturers regularly engaged in the production of such products which are of equal material, design and workmanship. Products shall have been in satisfactory commercial or industrial use for 2 years prior to bid opening. The 2-year period shall include applications of equipment and materials under similar circumstances and of similar size. The product shall have been on sale on the commercial market through advertisements, manufacturers' catalogs, or brochures during the 2-year period. Where 2 or more items of the same class of equipment are required, these items shall be products of a single manufacturer; however, the component parts of the item need not be the products of the same manufacturer unless stated in this section.
- C. Alternative Qualifications: Products having less than a 2-year field service record will be acceptable if a certified record of satisfactory field operation for not less than 6,000 hours, exclusive of the manufacturers' factory or laboratory tests, is furnished.
- D. Material and Equipment Manufacturing Date: Products manufactured more than 3 years prior to date of delivery to site shall not be used, unless specified otherwise.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

- A. Materials and equipment shall conform to the respective specifications and standards and to the specifications herein. Electrical ratings shall be as indicated.

2.02 CONDUIT, DUCTS, AND FITTINGS

- A. Plastic Conduit for Concrete Encasement: UL 651, Schedule 40 or Schedule 80 or as otherwise indicated.
- B. Duct Sealant
 - 1. Conduit Sealing Compound: Compounds for sealing ducts and conduit shall have a putty-like consistency workable with the hands at temperatures as low as 35 degrees F, shall neither slump at a temperature of 300 degrees F, nor harden materially when exposed to the air. Compounds shall adhere to clean surfaces of fiber or plastic ducts; metallic conduits or conduit coatings; concrete, masonry, or lead; any cable sheaths, jackets, covers, or insulation materials; and the common metals. Compounds shall form a seal without dissolving, noticeably changing characteristics, or removing any of the ingredients. Compounds shall have no injurious effect upon the hands of workmen or upon materials.
 - 2. UL 94, Class HBF: Provide high-expansion urethane foam duct sealant that expands and hardens to form a closed, chemically and water resistant, rigid structure. Sealant must be compatible with common cable and wire jackets and capable of adhering to metals, plastics and concrete. Sealant must be capable of curing in temperature ranges of 35 degrees F to 95 degrees F. Cured sealant must withstand temperature ranges of -20 degrees F to 200 degrees F without loss of function.

- C. Fittings:
 - 1. Metal Fittings: UL 514B.
 - 2. PVC Conduit Fittings: UL 514B, UL 651.

2.03 LOW VOLTAGE INSULATED CONDUCTORS AND CABLES

- A. Insulated conductors shall be rated 600 volts and conform to the requirements of NFPA 70, including listing requirements. Wires and cables manufactured more than 24 months prior to date of delivery to the site shall not be accepted. Service entrance conductors shall conform to UL 854, Type USE.
- B. Conductor Types: Cable sizes indicated are for THHN/THWN copper conductors unless otherwise noted.
- C. Conductor Material: Unless specified or indicated otherwise or required by NFPA 70, wires in conduit, other than service entrance, shall be 600-volt, Type THWN/THHN conforming to UL 83 or Type XHHW or RHW conforming to UL 44. Copper conductors shall be annealed copper complying with ASTM B3 and ASTM B8.
- D. Jackets: Multiconductor cables shall have an overall PVC outer jacket.
- E. Cable Marking:
 - 1. Insulated conductors shall have the date of manufacture and other identification imprinted on the outer surface of each cable at regular intervals throughout the cable length.
 - 2. Each cable shall be identified by means of a fiber, laminated plastic, or non-ferrous metal tags, or approved equal, in each electric manhole, telecommunications maintenance hole, handhole, junction box, and each terminal. Each tag shall contain the following information; cable type, conductor size, circuit number, circuit voltage, cable destination and phase identification.
 - 3. Conductors shall be color coded. Conductor identification shall be provided within each enclosure where a tap, splice, or termination is made. Conductor identification shall be by color-coded insulated conductors, plastic-coated self-sticking printed markers, colored nylon cable ties and plates, heat shrink type sleeves, or colored electrical tape. Control circuit terminations shall be properly identified. Color shall be green for grounding conductors and white for neutrals; except where neutrals of more than one system are installed in same raceway or box, other neutrals shall be white with a different colored (not green) stripe for each. Color of ungrounded conductors in different voltage systems shall be as follows:
 - a. 208/120 volt, 3-phase:
 - 1) Phase A - black.
 - 2) Phase B - red.
 - 3) Phase C - blue.

2.04 LOW VOLTAGE WIRE CONNECTORS AND TERMINALS

- A. UL 486A-486B. Shall provide a uniform compression over the entire conductor contact surface. Use solderless terminal lugs on stranded conductors.

2.05 LOW VOLTAGE SPLICES

- A. Provide splices in conductors with a compression connector on the conductor and by insulating and waterproofing using one of the following methods which are suitable for continuous submersion in water and comply with ANSI C119.1.
- B. Heat Shrinkable Splice: Provide heat shrinkable splice insulation by means of a thermoplastic adhesive sealant material which shall be applied in accordance with the manufacturer's written instructions.
- C. Cold Shrink Rubber Splice: Provide a cold-shrink rubber splice which consists of EPDM rubber tube which has been factory stretched onto a spiraled core which is removed during splice installation. The installation shall not require heat or flame, or any additional materials such as covering or adhesive. It shall be designed for use with inline compression type connectors, or indoor, outdoor, direct-burial or submerged locations.

2.06 TAPE

- A. Insulating Tape: UL 510, plastic insulating tape, capable of performing in a continuous temperature environment of 80 degrees C.

2.07 PULL STRING/ROPE

- A. Shall be plastic or flat pull line (bull line) having a minimum tensile strength of 200 pounds.

2.08 GROUNDING AND BONDING

- A. Driven Ground Rods: Provide copper-clad steel ground rods conforming to UL 467 not less than 3/4 inch in diameter by 10 feet in length. Sectional type rods may be used for rods 20 feet or longer.
- B. Grounding Conductors: Stranded-bare copper conductors shall conform to ASTM B8, Class B, soft-drawn unless otherwise indicated. Solid-bare copper conductors shall conform to ASTM B1 for sizes No. 8 and smaller. Insulated conductors shall be of the same material as phase conductors and green color-coded, except that conductors shall be rated no more than 600 volts. Aluminum is not acceptable.

2.09 UNDERGROUND STRUCTURES

- A. Provide precast concrete underground structure maintenance hole types as indicated, conforming to ASTM C857 and ASTM C478. Top, walls, and bottom shall consist of reinforced concrete. Walls and bottom shall be of monolithic concrete construction. Locate duct entrances and windows near the corners of structures to facilitate cable racking. Covers shall fit the frames without undue play. Form steel and iron to shape and size with sharp lines and angles. Castings shall be free from warp and blow holes that may impair strength or appearance. Exposed metal shall have a smooth finish and sharp lines and arises. Provide necessary lugs, rabbets, and brackets. Set pulling-in irons and other built-in items in place before depositing concrete. Install a pulling-in iron in the wall opposite each duct line entrance. Cable racks, including rack arms and insulators, shall be adequate to accommodate the cable.
- B. Precast Concrete Structures, Risers and Tops: Precast concrete underground structures may be provided subject to the requirements specified below, unless otherwise required by utility company standards. Precast units shall be the product of a

manufacturer regularly engaged in the manufacture of precast concrete products, including precast maintenance holes.

1. General: Precast concrete structures shall have the same accessories and facilities as required for cast-in-place structures. Likewise, precast structures shall have plan area and clear heights not less than those of cast-in-place structures. Concrete materials and methods of construction shall be the same as for cast-in-place concrete construction, as modified herein. Slope in floor may be omitted provided precast sections are poured in reinforced steel forms. Concrete for precast work shall have a 28-day compressive strength of not less than 4000 psi. Structures may be precast to the design and details indicated for cast-in-place construction, precast monolithically and placed as a unit, or structures may be assembled sections, designed and produced by the manufacturer in accordance with the requirements specified. Structures shall be identified with the manufacturer's name embedded in or otherwise permanently attached to an interior wall face.
 2. Construction: Structure top, bottom, and wall shall be of a uniform thickness of not less than 6 inches unless otherwise indicated. Thin-walled knock-out panels for designed or future duct bank entrances shall not be permitted. Quantity, size, and location of duct bank entrance windows shall be as directed, and cast completely open by the precaster. Size of windows shall exceed the nominal duct bank envelope dimensions by at least 12 inches vertically and horizontally to preclude in-field window modifications made necessary by duct bank misalignment. However, the sides of precast windows shall be a minimum of 6 inches from the inside surface of adjacent walls, floors, or ceilings. Form the perimeter of precast window openings to have a keyed or inward flared surface to provide a positive interlock with the mating duct bank envelope. Provide welded wire fabric reinforcing through window openings for in-field cutting and flaring into duct bank envelopes. Provide additional reinforcing steel comprised of at least 2 No. 4 bars around window openings. Provide drain sumps a minimum of 12 inches in diameter and 4 inches deep for precast structures.
 3. Joints: Provide tongue-and-groove joints on mating edges of precast components. Shiplap joints are not allowed. Design joints to firmly interlock adjoining components and to provide waterproof junctions and adequate shear transfer. Seal joints watertight using preformed plastic strip conforming to ASTM C990. Install sealing material in strict accordance with the sealant manufacturer's printed instructions. Provide waterproofing at conduit/duct entrances into structures, and where access frame meets the top slab, provide continuous grout seal.
- C. Handhole Frames and Covers: Frames and covers of steel shall be welded by qualified welders in accordance with standard commercial practice. Steel covers shall be rolled-steel floor plate having an approved anti-slip surface. Hinges shall be of wrought steel, 5 inches by 5 inches by approximately 3/16 inch thick, without screw holes, and shall be for full surface application by fillet welding. Hinges shall have non-removable pins and 5 knuckles. The surfaces of plates under hinges shall be true after the removal of raised anti-slip surface, by grinding or other approved method.

2.10 CABLE TAGS IN HANDHOLES

- A. Provide tags for each cable located in manholes, maintenance holes and handholes. The tags shall be polyethylene. Do not provide handwritten letters. The first position on the power cable tag shall denote the voltage. The second through sixth positions on the

tag shall identify the circuit. The next to last position shall denote the phase of the circuit and shall include the Greek "phi" symbol. The last position shall denote the cable size. As an example, a tag could have the following designation: "11.5 NAS 1-8(Phase A)500," denoting that the tagged cable is on the 11.5kV system circuit number NAS 1-8, underground, Phase A, sized at 500 kcmil.

- B. Polyethylene Cable Tags: Provide tags of polyethylene that have an average tensile strength of 3250 pounds per square inch; and that are 0.08 inch thick (minimum), non-corrosive non-conductive; resistive to acids, alkalis, organic solvents, and salt water; and distortion resistant to 170 degrees F. Provide 0.05 inch (minimum) thick black polyethylene tag holder. Provide a one-piece nylon, self-locking tie at each end of the cable tag. Ties shall have a minimum loop tensile strength of 175 pounds. The cable tags shall have black block letters, numbers, and symbols one inch high on a yellow background. Letters, numbers, and symbols shall not fall off or change positions regardless of the cable tags' orientation.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install equipment and devices in accordance with the manufacturer's published instructions and with the requirements and recommendations of NFPA 70 and IEEE C2 as applicable.

3.02 CABLE INSPECTION

- A. Prior to installation, each cable reel shall be inspected for correct storage positions, signs of physical damage, and broken end seals. If end seal is broken, moisture shall be removed from cable prior to installation in accordance with the cable manufacturer's recommendations.

3.03 UNDERGROUND STRUCTURE CONSTRUCTION

- A. Provide standard type precast/prefabricated construction as specified herein. Horizontal concrete surfaces of floors shall have a smooth trowel finish. Cure concrete by applying 2 coats of white pigmented membrane forming-curing compound in strict accordance with the manufacturer's printed instructions, except that precast concrete may be steam cured. Curing compound shall conform to ASTM C309. Locate duct entrances and windows in the center of end walls (shorter) and near the corners of sidewalls (longer) to facilitate cable racking and splicing. Covers for underground structures shall fit the frames without undue play. Steel and iron shall be formed to shape and size with sharp lines and angles. Castings shall be free from warp and blow holes that may impair strength or appearance. Exposed metal shall have a smooth finish and sharp lines and arises. Provide necessary lugs, rabbets, and brackets. Set pulling-in irons and other built-in items in place before depositing concrete. Underground structure locations, as indicated, are approximate. Coordinate exact underground structure locations with other utilities and finished grading and paving.
- B. Precast/Prefabricated Structure Construction: Set commercial precast/prefabricated structures on 6 inches of level, 90 percent compacted, granular fill, 3/4 inch to one inch size, extending 12 inches beyond the structure on each side. Compact granular fill by a

minimum of 4 passes with a plate type vibrator. Installation shall additionally conform to the manufacturer's instructions.

- C. Field Painting: Cast-iron frames and covers not buried in concrete or masonry shall be cleaned of mortar, rust, grease, dirt and other deleterious materials, and given a coat of bituminous paint.

3.04 UNDERGROUND CONDUIT AND DUCT SYSTEMS

- A. Depths to top of the conduit shall be in accordance with NFPA 70. Run conduit in straight lines except where a change of direction is necessary. Numbers and sizes of ducts shall be as indicated. Ducts shall have a continuous slope downward toward underground structures and away from buildings, laid with a minimum slope of 3 inches per 100 feet. Depending on the contour of the finished grade, the high-point may be at a terminal, an electric manhole, a telecommunications maintenance hole, a handhole, or between manholes/maintenance holes or handholes.
- B. Perform changes in ductbank direction as follows:
 - 1. Short-radius 90-degree duct bends may be used only for pole or equipment risers, unless specifically indicated as acceptable.
 - 2. The minimum manufactured bend radius shall be 18 inches for ducts of less than 3 inch diameter, and 36 inches for ducts 3 inches or greater in diameter.
 - 3. As an exception to the bend radius required above, provide field manufactured long sweep bends having a minimum radius of 25 feet for a change of direction of more than 5 degrees, either horizontally or vertically. Both curved and straight sections may be used to form long sweep bends, but the maximum curve used shall be 30 degrees and manufactured bends shall be used.
- C. Treatment: Ducts shall be kept clean of concrete, dirt, or foreign substances during construction. Field cuts requiring tapers shall be made with proper tools and match factory tapers. A coupling recommended by the duct manufacturer shall be used whenever an existing duct is connected to a duct of different material or shape. Ducts shall be stored to avoid warping and deterioration with ends sufficiently plugged to prevent entry of any water or solid substances. Ducts shall be thoroughly cleaned before being laid. Plastic ducts shall be stored on a flat surface and protected from the direct rays of the sun.
- D. Conduit Cleaning: As each conduit run is completed, for conduit sizes 3 inches and larger, draw a flexible testing mandrel approximately 12 inches long with a diameter less than the inside diameter of the conduit through the conduit. After which, draw a stiff bristle brush through until conduit is clear of particles of earth, sand and gravel; then immediately install conduit plugs. For conduit sizes less than 3 inches, draw a stiff bristle brush through until conduit is clear of particles of earth, sand and gravel; then immediately install conduit plugs.
- E. Jacking and Drilling Under Roads and Structures: Conduits to be installed under existing paved areas which are not to be disturbed and under roads shall be zinc-coated, rigid steel, jacked into place. Where ducts are jacked under existing pavement, rigid steel conduit will be installed because of its strength. To protect the corrosion-resistant conduit coating, predrilling or installing conduit inside a larger iron pipe sleeve (jack-and-

sleeve) is required. Separators or spacing blocks shall be made of steel, concrete, plastic, or a combination of these materials placed not farther apart than 4 feet on centers.

- F. Multiple Conduits: Stagger the joints of the conduits by rows (horizontally) and layers (vertically) to strengthen the conduit assembly. Provide plastic duct spacers that interlock vertically and horizontally. Spacer assembly shall consist of base spacers, intermediate spacers, ties, and locking device on top to provide a completely enclosed and locked-in conduit assembly. Install spacers per manufacturer's instructions, but provide a minimum of 2 spacer assemblies per 10 feet of conduit assembly.
- G. Conduit Plugs and Pull Rope: New conduit indicated as being unused or empty shall be provided with plugs on each end. Plugs shall contain a weep hole or screen to allow water drainage. Provide a plastic pull rope having 3 feet of slack at each end of unused or empty conduits.
- H. Duct Encased in Concrete: Construct underground duct lines of individual conduits encased in concrete. Do not mix different kinds of conduit in any one duct bank. Unless otherwise indicated, depths to top of the concrete envelope must be not less than 18 inches below finished grade, except under roads and pavement, concrete envelope must be not less than 24 inches below finished grade. Concrete encasement surrounding the bank shall be rectangular in cross-section and shall provide at least 3 inches of concrete cover for ducts. Separate conduits by a minimum concrete thickness of 2 inches, except separate light and power conduits from control, signal, and telecommunications conduits by a minimum concrete thickness of 3 inches. Before pouring concrete, anchor duct bank assemblies to prevent the assemblies from floating during concrete pouring. Anchoring shall be done by driving reinforcing rods adjacent to duct spacer assemblies and attaching the rods to the spacer assembly. Provide color, type and depth of warning tape as indicated in the drawings.
 - 1. Ducts shall be provided with end bells whenever duct lines terminate in structures.
 - 2. Connections to Existing Underground Structures: For duct bank connections to existing structures, break the structure wall out to the dimensions required and preserve steel in the structure wall. Cut steel and extend into the duct bank envelope. Chip the perimeter surface of the duct bank opening to form a key or flared surface, providing a positive connection with the duct bank envelope.
 - 3. Partially Completed Duct Banks: During construction wherever a construction joint is necessary in a duct bank, prevent debris such as mud, and, and dirt from entering ducts by providing suitable conduit plugs. Fit concrete envelope of a partially completed duct bank with reinforcing steel extending a minimum of 2 feet back into the envelope and a minimum of 2 feet beyond the end of the envelope. Provide one No. 4 bar in each corner, 3 inches from the edge of the envelope. Secure corner bars with 2 No. 3 ties, spaced approximately one foot apart. Restrain reinforcing assembly from moving during concrete pouring.
 - 4. Seal all electrical penetrations for radon mitigation, maintaining integrity of the vapor barrier, and to prevent infiltration of air, insects, and vermin.

3.05 CABLE PULLING

- A. Test existing duct lines with a mandrel and thoroughly swab out to remove foreign material before pulling cables. Pull cables down grade with the feed-in point at the manhole/maintenance hole or buildings of the highest elevation. Use flexible cable feeds to convey cables through manhole/maintenance hole opening and into duct runs. Do not exceed the specified cable bending radii when installing cable under any conditions, including turn-ups into switches, transformers, switchgear, switchboards, and other enclosures. Cable with tape shield shall have a bending radius not less than 12 times the overall diameter of the completed cable. If basket-grip type cable-pulling devices are used to pull cable in place, cut off the section of cable under the grip before splicing and terminating.
- B. Cable Lubricants: Use lubricants that are specifically recommended by the cable manufacturer for assisting in pulling jacketed cables.

3.06 CABLES IN UNDERGROUND STRUCTURES

- A. Do not install cables utilizing the shortest path between penetrations, but route along those walls providing the longest route and the maximum spare cable lengths. Form cables to closely parallel walls, not to interfere with duct entrances, and support on brackets and cable insulators. Support cable splices in underground structures by racks on each side of the splice. Locate splices to prevent cyclic bending in the spliced sheath. Install cables at middle and bottom of cable racks, leaving top space open for future cables, except as otherwise indicated for existing installations. Provide one spare 3-insulator rack arm for each cable rack in each underground structure.
- B. Cable Tag Installation: Install cable tags in each manhole/maintenance hole or handhole as specified, including each splice. Tag wire and cable provided by this contract. Install cable tags over the fireproofing, if any, and locate the tags so that they are clearly visible without disturbing any cabling or wiring in the manholes/maintenance holes.

3.07 CONDUCTORS INSTALLED IN PARALLEL

- A. Conductors shall be grouped such that each conduit of a parallel run contains one Phase A conductor, one Phase B conductor, one Phase C conductor, and one neutral conductor.

3.08 LOW VOLTAGE CABLE SPLICING AND TERMINATING

- A. Make terminations and splices with materials and methods as indicated or specified herein and as designated by the written instructions of the manufacturer. Do not allow the cables to be moved until after the splicing material has completely set. Make splices in underground distribution systems only in accessible locations such as manholes, maintenance holes, handholes, or aboveground termination cabinets.

3.09 GROUNDING SYSTEMS

- A. Provide grounding system as indicated, in accordance with NFPA 70 and IEEE C2, and as specified herein. Provide grounding systems with a resistance to solid earth not exceeding 25 ohms.
- B. Grounding Electrodes: Provide cone pointed driven ground rods driven full depth plus 6 inches, installed to provide an earth ground of the appropriate value for the particular equipment being grounded. If the specified ground resistance is not met, an additional

ground rod shall be provided in accordance with the requirements of NFPA 70 (placed not less than 6 feet from the first rod). Should the resultant (combined) resistance exceed the specified resistance, measured not less than 48 hours after rainfall, the Contracting Officer shall be notified immediately.

- C. Grounding Connections: Make grounding connections which are buried or otherwise normally inaccessible, by exothermic weld or compression connector.
 - 1. Make exothermic welds strictly in accordance with the weld manufacturer's written recommendations. Welds which are "puffed up" or which show convex surfaces indicating improper cleaning are not acceptable. Mechanical connectors are not required at exothermic welds.
 - 2. Make compression connections using a hydraulic compression tool to provide the correct circumferential pressure. Tools and dies shall be as recommended by the manufacturer. An embossing die code or other standard method shall provide visible indication that a connector has been adequately compressed on the ground wire.
- D. Grounding Conductors: Provide bare grounding conductors, except where installed in conduit with associated phase conductors. Ground cable sheaths, cable shields, conduit, and equipment with No. 6 AWG. Ground other noncurrent-carrying metal parts and equipment frames of metal-enclosed equipment. Ground metallic frames and covers of handholes and pull boxes with a braided, copper ground strap with equivalent ampacity of No. 6 AWG.
- E. Ground Cable Crossing Expansion Joints: Protect ground cables crossing expansion joints or similar separations in structures and pavements by use of approved devices or methods of installation which provide the necessary slack in the cable across the joint to permit movement. Use stranded or other approved flexible copper cable across such separations.

3.10 EXCAVATING, BACKFILLING, AND COMPACTING

- A. Provide in accordance with NFPA 70.
- B. General Excavation and Trenching: Keep excavations free from water while construction is in progress. Notify the Contracting Officer immediately in writing if it becomes necessary to remove rock or hard, unstable, or otherwise unsatisfactory material to a depth greater than indicated. Make trench sides as nearly vertical as practicable except where sloping of sides is allowed. Sides of trenches shall not be sloped from the bottom of the trench up to the elevation of the top of the conduit. Excavate ledge rock, boulders, and other unyielding material to an overdepth at least 6 inches below the bottom of the conduit unless otherwise indicated or specified. Blasting will not be permitted. Use gravel placed in 6 inch maximum layers to refill overdepths to the proper grade. At Contractor's option, the excavations may be cut to an overdepth of not less than 4 inches and refilled to required grade as specified. Grade bottom of trenches accurately to provide uniform bearing and support for each section of conduit on undisturbed soil at every point along its entire length. Trench dimensions shall be as indicated.
- C. Backfilling: Construct backfill in two operations (initial and final) as indicated and specified in this section. Place initial backfill in 6 inch maximum loose lifts to one foot

above conduit unless otherwise specified. Ensure that initially placed material is tamped firmly under pipe haunches. Bring up evenly on each side and along the full length of conduit. Ensure that no damage is done to the conduit or its protective coating. Place the remainder of the backfill (final backfill) in 9 inch maximum loose lifts unless otherwise specified. Compact each loose lift as specified in paragraph entitled "Compaction" before placing the next lift. Where settlements greater than the tolerance typically allowed for grading occur in trenches due to improper compaction, excavate to the depth necessary to rectify the problem, then backfill and compact the excavation as specified herein and restore the surface to the required elevation. Coordinate backfilling with testing of conduits. Provide buried warning and identification tape installed in accordance with the manufacturer's recommendation.

D. Compaction: Use hand-operated, plate-type, vibratory, or other suitable hand tampers in areas not accessible to larger rollers or compactors. Avoid damaging conduits and protective conduit coatings. Compact material in accordance with the following unless otherwise specified. If necessary, alter, change, or modify selected equipment or compaction methods to meet specified compaction requirements.

1. Compaction of Conduit and Initial Backfill: Compact each lift to a dense consistency as evidenced by little to no settlement of the gravel under repeated passes with the compaction equipment but not less than a minimum of five passes of a hand operated type vibratory compactor with the vibrator turned on.

2. Compaction of Final Backfill: Moisture condition the final backfill to between optimum and 3 percent wet of the optimum content and compact to at least 90 percent ASTM D 1557 maximum dry unit weight. Under areas to be seeded or sodded, compact succeeding layers of final backfill to 85 percent of ASTM D 1557 maximum dry unit weight. For conduits under structures and pavements, the top 24 inches of backfill below the finish subgrade level shall consist of controlled backfill placed in not more than 8 inch thick loose horizontal lifts, moisture conditioned to within 2 percent of optimum moisture content, and compacted to at least 95 percent of ASTM D 1557 maximum dry unit weight.

E. Reconditioning of Surfaces:

1. Paving Repairs: Where trenches, pits, or other excavations are made in existing roadways and other areas of pavement where surface treatment of any kind exists, restore such surface treatment or pavement the same thickness and in the same kind as previously existed, except as otherwise specified, and to match and tie into the adjacent and surrounding existing surfaces.

3.11 FIELD QUALITY CONTROL

A. Performance of Field Acceptance Checks and Tests: Perform in accordance with the manufacturer's recommendations, and include the following visual and mechanical inspections and electrical tests, performed in accordance with NETA ATS.

1. Low Voltage Cables, 600-Volt: Perform tests after installation of cable, splices and terminations and before terminating to equipment or splicing to existing circuits.

a. Visual and Mechanical Inspection

1) Inspect exposed cable sections for physical damage.

2) Verify that cable is supplied and connected in accordance with contract plans and specifications.

- 3) Verify tightness of accessible bolted electrical connections.
 - 4) Inspect compression-applied connectors for correct cable match and indentation.
 - 5) Visually inspect jacket and insulation condition.
 - 6) Inspect for proper phase identification and arrangement.
- b. Electrical Tests:
- 1) Perform insulation resistance tests on wiring No. 6 AWG and larger diameter using instrument which applies voltage of approximately 1000 volts dc for one minute.
 - 2) Perform continuity tests to insure correct cable connection.
2. Grounding System:
- a. Visual and Mechanical Inspection: Inspect ground system for compliance with contract plans and specifications
 - b. Electrical Tests: Perform ground-impedance measurements utilizing the fall-of-potential method in accordance with IEEE 81. On systems consisting of interconnected ground rods, perform tests after interconnections are complete. On systems consisting of a single ground rod perform tests before any wire is connected. Take measurements in normally dry weather, not less than 48 hours after rainfall. Use a portable megohmmeter tester in accordance with manufacturer's instructions to test each ground or group of grounds. The instrument shall be equipped with a meter reading directly in ohms or fractions thereof to indicate the ground value of the ground rod or grounding systems under test.
- B. Follow-Up Verification: Upon completion of acceptance checks and tests, the Contractor shall show by demonstration in service that circuits and devices are in good operating condition and properly performing the intended function. As an exception to requirements stated elsewhere in the contract, the Contracting Officer shall be given 5 working days advance notice of the dates and times of checking and testing.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

All work specified in this section shall not be measured nor paid for separately but shall be considered incidental to Bid Item No. 5 – Electrical Work, of the Proposal and Proposal Schedule.

END OF SECTION

**Requirements of Chapter 104, HRS
Wages and Hours of Employees on Public Works Law**

Chapter 104, HRS, applies to every public works construction project over \$2,000, regardless of the method of procurement or financing (purchase order, voucher, bid, contract, lease arrangement, warranty, SPRB).

Rate of Wages for Laborers and Mechanics

- Minimum prevailing wages (basic hourly rate plus fringe benefits), as determined by the Director of Labor and Industrial Relations and published in wage rate schedules, shall be paid to the various classes of laborers and mechanics working on the job site. [§104-2(a), (b), Hawaii Revised Statutes (HRS)]
- If the Director of Labor determines that prevailing wages have increased during the performance of a public works contract, the rate of pay of laborers and mechanics shall be raised accordingly. [§104-2(a) and (b), HRS; §12-22-3(d) Hawaii Administrative Rules (HAR)]

Overtime

- Laborers and mechanics working on a Saturday, Sunday, or a legal holiday of the State or more than eight hours a day on any other day shall be paid overtime compensation at not less than one and one-half times the basic hourly rate plus the cost of fringe benefits for all hours worked. If the Director of Labor determines that a prevailing wage is defined by a collective bargaining agreement, the overtime compensation shall be at the rates set by the applicable collective bargaining agreement [§§104-1, 104-2(c), HRS]

Weekly Pay

- Laborers and mechanics employed on the job site shall be paid their full wages at least once a week, without deduction or rebate, except for legal deductions, within five working days after the cutoff date. [§104-2(d), HRS]

Posting of Wage Rate Schedules

- Wage rate schedules with the notes for prevailing wages and special overtime rates, shall be posted by the contractor in a prominent and easily accessible place at the job site. A copy of the entire wage rate schedule shall be given to each laborer and mechanic employed under the contract, except when the employee is covered by a collective bargaining agreement. [§104-2(d), HRS]

Withholding of Accrued Payments

- If necessary, the contracting agency may withhold accrued payments to the contractor to pay to laborers and mechanics employed by the contractor or subcontractor on the job site any difference between the wages required by the public works contract or specifications and the wages received. [§104-2(e), HRS]

Certified Weekly Payrolls and Payroll Records

- A certified copy of all payrolls shall be submitted weekly to the contracting agency.
- The contractor is 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 listed are not less than the applicable rates contained in the applicable wage rate schedule, and that the classifications for each laborer or mechanic conform with the work the laborer or mechanic performed. [§104-3(a), HRS]
- Payroll records shall be maintained by the contractor and subcontractors for three years after completion of construction. The records shall contain: [HAR §12-22-10]
 - the name and home address of each employee
 - the employee's correct classification
 - rate of pay (basic hourly rate + fringe benefits)
 - itemized list of fringe benefits paid
 - daily and weekly hours worked
 - weekly straight time and overtime earnings
 - amount and type of deductions
 - actual wages paid
 - date of payment
- Records shall be made available for inspection by the contracting agency, the Department of Labor and Industrial Relations, and any of its authorized representatives, who may also interview employees during working hours on the job. [§104-3(b), HRS]

SURETY BID BOND

Bond No. _____

KNOW ALL BY THESE PRESENTS:

That we, _____
(Full name or legal title of offeror)

as Offeror, hereinafter called the Principal, and

(Name of bonding company)

as Surety, hereinafter called Surety, a corporation authorized to transact business as a
Surety in the State of Hawaii, are held and firmly bound unto

(State/county entity)
as Owner, hereinafter called Owner, in the penal sum of

(Required amount of bid 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 Owner shall reject said offer, or
in the alternate, accept the offer of the Principal and the Principal shall enter into a
contract with the Owner 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 _____, _____

(Seal) _____
Name of Principal (Offeror)

Signature

Title

(Seal) _____
Name of Surety

Signature

Title

**STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HONOLULU, HAWAII**

FORMS

Contents:

Contract

Performance Bond (Surety)

Performance Bond

Labor and Material Payment Bond (Surety)

Labor and Material Payment Bond

Chapter 104 Compliance Certificate

Certification of Compliance for Employment of State Residents

C O N T R A C T

THIS AGREEMENT, made this _____ day _____ 20_____, by and between the STATE OF HAWAII, by its Director of Transportation, hereinafter referred to as "STATE," and _____ whose business and/or post office address is _____

_____ hereafter referred to as "CONTRACTOR":

WITNESSETH: That for and in consideration of the payments hereinafter mentioned, the CONTRACTOR hereby covenants and agrees with the STATE to complete in place, furnish and pay for all labor and materials necessary for

or such a part thereof as shall be required by the STATE, the total amount of which labor, material and construction shall be computed at the unit and/or lump sum prices set forth in the attached proposal schedule and shall be the sum of _____ DOLLARS (\$ _____) as follows:

which sum shall be provided from the following fund(s):

all in accordance with the specifications, the special provisions, if any, the notice to bidders, the instructions to bidders, the proposal, and plans for _____, on file in the office of the Director of Transportation. These documents, together with all alterations, amendments, and additions thereto and deductions therefrom, are attached hereto or incorporated herein by reference and made a part of this contract.

The CONTRACTOR hereby covenants and agrees to complete such construction within _____ (_____) working days from the date indicated in the notice to proceed from the STATE subject, however, to such extensions as may be provided for under the specifications.

For and in consideration of the covenants, undertaking and agreements of the CONTRACTOR herein set forth and upon the full and faithful performance thereof by the CONTRACTOR, the STATE hereby agrees to pay the CONTRACTOR the sum of _____ DOLLARS (\$ _____) in lawful money, but not more than such part of the same as is actually earned according to the STATE'S determination of the actual quantities of work performed and materials furnished by the CONTRACTOR at the unit or lump sum prices set forth in the attached proposal schedule. Such payment, including any extras, shall be made, subject to such additions or deductions hereto or hereafter made in the manner and at the time prescribed in the specifications and this contract. In any event, extras shall not exceed _____ DOLLARS (\$ _____) in lawful money and shall be provided from the following fund(s):

Where Federal funds are involved, it is covenanted and agreed by and between the parties hereto that the sums of

shall be paid out of the applicable Federal funds, and that this contract shall be construed to be an agreement to pay said sums to the Contractor only out of the aforesaid Federal funds if and when such Federal funds shall be received from the Federal Government, and that this contract shall not be construed to be a general agreement to pay said portions at all events out of any funds other than those which may be so received from the Federal Government; provided, that if the Federal share of the cost of the project is not immediately forthcoming from the Federal Government, the STATE may advance the CONTRACTOR the anticipated Federal reimbursement of the cost of the completed portions of the work from funds which have been appropriated by the STATE for its pro rata share.

The CONTRACTOR further agrees to execute the attached non-gratuity affidavit form prior to payment of the final estimate by the STATE.

All words used herein in the singular number shall extend to and include the plural. All words used in the plural number shall extend to and include the singular. The use of any gender shall extend to and include all genders.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be duly executed the day and year first above written.

STATE OF HAWAII

By _____
Director of Transportation

By _____

By _____

APPROVED AS TO FORM

Deputy Attorney General

PERFORMANCE BOND (SURETY)
(6/21/07)

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 Hawaii, are held and firmly bound unto the _____,
(State/County Entity)

its successors and assigns, hereinafter called 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 signed a Contract with Obligee 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 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 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 Obligee in satisfaction of the surety's performance obligation on this bond.

Signed this _____ day of _____, _____.

(Seal)

Name of Principal (Contractor)

*

Signature

Title

(Seal)

Name of Surety

*

Signature

Title

***ALL SIGNATURES MUST BE ACKNOWLEDGED
BY A NOTARY PUBLIC**

PERFORMANCE BOND

KNOW 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

(State/County entity)

its successors and assigns, as Oblige, hereinafter called Oblige, in the amount

DOLLARS
(\$ _____),
(Dollar amount of Contract)

lawful money of the United States of America, for the payment of which to the said Oblige, well and truly to be made, Contractor binds itself, its heir, 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 _____
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 _____
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 _____
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 _____
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 to _____;

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 Oblige, its successors or assigns, in the event of a breach of any, or all, or any part of, 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 _____,
_____.

(Seal) _____
Name of Contractor

* _____
Signature

Title

*ALL SIGNATURES MUST BE
ACKNOWLEDGED BY A NOTARY PUBLIC

LABOR AND MATERIAL PAYMENT BOND (SURETY)
(6/21/07)

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 Hawaii, are held and firmly bound unto the _____,
(State/County Entity)

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 Contract with the 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 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.

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 Principal and its Surety on this bond at the time and in the manner prescribed in Section 103D-324, Hawaii Revised Statutes, and have the rights and claims adjudicated in the action, and judgment rendered thereon; subject to the Obligee'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 Obligee, the remainder shall be distributed pro rata among the claimants.

Signed this _____ day of _____, _____.

(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

KNOW 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 _____
(State/County entity)

its successors and assigns, as Obligee, hereinafter called Obligee, in the amount
_____ DOLLARS (\$ _____),
(Dollar amount of Contract)

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 heir, 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 _____
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 _____
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 _____
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 _____
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 to _____;

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, 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, 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), Hawaii Revised Statutes.

The amount of this bond may be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payments 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

CHAPTER 104, HRS COMPLIANCE CERTIFICATE

The undersigned bidder does hereby certify to the following:

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.

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.

DATED at Honolulu, Hawaii, this _____ day of _____.

Name of Corporation, Partnership, or Individual

Signature and Title of Signer

Subscribed and sworn before me this _____ day of _____.

Doc. Date: _____ # Pages: _____.

Notary Name: _____ Circuit
Doc. Description: _____

Notary Public, _____ Judicial Circuit,
State of Hawaii
My Commission Expires: _____

Notary Signature Date
NOTARY CERTIFICATION

**PROVISIONS TO BE INCLUDED IN
CONSTRUCTION PROCUREMENT SOLICITATIONS**

1. Definitions for terms used in HRS Chapter 103B as amended by Act 192, SLH 2011:
 - a. "Contract" means contracts for construction under 103D, HRS.
 - b. "Contractor" has the same meaning as in Section 103D-104, HRS, provided that "contractor" includes a subcontractor where applicable.
 - c. "Construction" has the same meaning as in Section 103D-104, HRS.
 - d. "General Contractor" means any person having a construction contract with a governmental body.
 - e. "Procurement Officer" has the same meaning as in Section 103D-104, HRS.
 - f. "Resident" means a person who is physically present in the State of Hawai'i at the time the person claims to have established the person's domicile in the State of Hawai'i and shows the person's intent is to make Hawai'i the person's primary residence.
 - g. "Shortage trade" means a construction trade in which there is a shortage of Hawai'i residents qualified to work in the trade as determined by the Department of Labor and Industrial Relations.

2. HRS Chapter 103B as amended by Act 192, SLH 2011--Employment of State Residents Requirements:
 - a. A Contractor awarded a contract shall ensure that Hawai'i residents comprise not less than 80% of the workforce employed to perform the contract work on the project. The 80% requirement shall be determined by dividing the total number of hours worked on the contract by Hawai'i residents, by the total number of hours worked on the contract by all employees of the Contractor in the performance of the contract. The hours worked by any Subcontractor of the Contractor shall count towards the calculation for this section. The hours worked by employees within shortage trades, as determined by the Department of Labor and Industrial Relations (DLIR), shall not be included in the calculation for this section.

- b. Prior to award of a contract, an Offeror/Bidder may withdraw an offer/bid without penalty if the Offeror/Bidder finds that it is unable to comply with HRS Chapter 103B as amended by Act 192, SLH 2011.
- c. Prior to starting any construction work, the Contractor shall submit the subcontract dollar amount for each of its Subcontractors.
- d. The requirements of this section shall apply to any subcontract of \$50,000 or more in connection with the Contractor; that is, such Subcontractors must also ensure that Hawai'i residents comprise not less than 80% of the Subcontractor's workforce used to perform the subcontract.
- e. The Contractor and any Subcontractor whose subcontract is \$50,000 or more shall comply with the requirements of HRS Chapter 103B as amended by Act 192, SLH 2011.
 - 1) Certification of compliance shall be made in writing under oath by an officer of the General Contractor and applicable Subcontractors and submitted with the final payment request.
 - 2) The certification of compliance shall be made under oath by an officer of the company by completing a "Certification of Compliance for Employment of State Residents" form and executing the Certificate before a licensed notary public.
 - 3) In addition to the certification of compliance as indicated above, the Contractor and Subcontractors shall maintain records such as certified payrolls for laborers and mechanics who performed work at the site and time sheets for all other employees who performed work on the project. These records shall include the names, addresses and number of hours worked on the project by all employees of the Contractor and Subcontractor who performed work on the project to validate compliance with HRS Chapter 103B as amended by Act 192, SLH 2011. The Contractor and Subcontractors shall retain these records and provide access to the State for a minimum period of four (4) years after the final payment, except that if any litigation, claim, negotiation, investigation, audit or other action involving the records has been started before the expiration of the four-year period, the Contractor and Subcontractors shall retain the records until completion of the action and resolution of all issues that arise from it, or until the end of the four-year period, whichever occurs later. Furthermore, it shall be the Contractor's responsibility to enforce compliance with this provision by any Subcontractor.

- f. A General Contractor or applicable Subcontractor who fails to comply with this section shall be subject to any of the following sanctions:
- 1) With respect to the General Contractor, withholding of payment on the contract until the Contractor or its Subcontractor complies with HRS Chapter 103B as amended by Act 192, SLH 2011.
 - 2) Proceedings for debarment or suspension of the Contractor or Subcontractor under Hawai'i Revised Statutes §103D-702.
3. Conflict with Federal Law: This section shall not apply if the application of this section is in conflict with any federal law, or if the application of this section will disqualify the State from receiving Federal funds or aid.

**CERTIFICATION OF COMPLIANCE
FOR
EMPLOYMENT OF STATE RESIDENTS
HRS CHAPTER 103B, AS AMENDED BY ACT 192, SLH 2011**

Project Title: _____

Agency Project No: _____

Contract No.: _____

As required by Hawai'i Revised Statutes Chapter 103B, as amended by Act 192, Session Laws of Hawaii 2011--Employment of State Residents on Construction Procurement Contracts, I hereby certify under oath, that I am an officer of _____ and
(Name of Contractor or Subcontractor Company)
for the Project Contract indicated above, _____ was in
(Name of Contractor or Subcontractor Company)
compliance with HRS Chapter 103B, as amended by Act 192, SLH 2011, by employing a workforce of which 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 _____, 2011.

Doc. Date: _____ # of Pages _____ 1st Circuit

Notary Name: _____

Doc. Description: _____

Notary Public, 1st Circuit, State of Hawai'i
My commission expires: _____

Notary Signature

Date

NOTARY CERTIFICATION

SAMPLE MONTHLY ESTIMATE

**Maui Baseyard Office Expansion & Renovation,
Part 2**

1234 Any Street, Kahului, Hawaii 12345 Phone: (808)123-1234 Fax: (808)123-1235 Email: name@email.com

Bill To: c/o District Engineer
Maui District
Highways Division
Department of Transportation
650 Palapala Drive
Kahului, HI 96732

Date: _____
Invoice No. _____
Contract No. _____
Purchase Order No. _____
Project No: _____

Project Title: Maui District Administration Building Roof Repairs, Island of Maui
Periods Covered: *(full month pay period, head-to-tail format, first pay period from the NTP date to the following month similar to this sample):* July 10, 2022 through August 9, 2022

Bid Item No.	Description	Unit Price	Amount
1	General Requirements	Lump Sum	\$ _____
2	Site Preparation – Fuel Station	Lump Sum	\$ _____
3	Repair – Fuel Station Pavement	Lump Sum	\$ _____
4	Repair – Fueling Systems	Lump Sum	\$ _____
5	Electrical Work	Lump Sum	\$ _____
6	Environmental	Lump Sum	\$ _____
7	Hazardous Materials Remediation	Force Account	\$ 60,000
TOTAL AMOUNT FOR COMPARISON OF BIDS (For comparison of bids, sum of Bid Item Nos. 1 through 7)			\$ _____

Pursuant to Section 8.4 Progress and/or Partial Payments, of the General Conditions, I certify that services requested under the contract have been performed by Maui District Administration Building Roof Repairs Company according to the contract.

First M. Last
President
Maui District Administration Roof Repairs Company

GEOTECHNICAL ENGINEERING EXPLORATION

**SITE IMPROVEMENTS AT DOT KAHULUI BASEYARD
650 PALAPALA DRIVE
TMK: (2) 3-8-079: 018 (POR.)
KAHULUI, MAUI, HAWAII**

AUGUST 7, 2020

Prepared for:
ENVIROSERVICES & TRAINING CENTER, LLC

PROJECT NO. 031620-00



Kokua Geotech LLC
Soil and Foundation Engineering

August 7, 2020
Project No. 031620-00

EnviroServices & Training Center, LLC
505 Ward Avenue, Suite #202
Honolulu, HI 96814

Attention: Mr. Brant Tanaka

Subject: **Geotechnical Engineering Exploration**
Site Improvements at DOT Kahului Baseyard
650 Palapala Drive
TMK: (2) 3-8-079: 018 (Por.)
Kahului, Maui, Hawaii

Dear **Mr. Tanaka**:

We are pleased to submit this report entitled "Geotechnical Engineering Exploration, Site Improvements at DOT Kahului Baseyard, 650 Palapala Drive, TMK: (2) 3-8-079: 018 (Por.), Kahului, Maui, Hawaii" prepared for the design of the project.

The purpose of our field exploration and this report was to observe and evaluate the general subsurface conditions at accessible locations at the project site to formulate geotechnical recommendations to assist in the design of the project. Our work was performed in general accordance with the scope of services outlined in our fee proposal dated March 18, 2020.

Our findings and recommendations are summarized as follows:

1. Our field exploration generally encountered pavement structures consisting of about 3 and 5 inches of asphaltic concrete and about 3 and 6 inches of base material overlying alluvial soils and basalt rock formation extending down to the maximum depth explored of about 14.7 feet below the existing ground surface.

The alluvial soils were encountered to depths of about 11 and 14.5 feet below the existing ground surface and generally consisted of loose to medium dense silty sand and stiff to very stiff sandy silt and sandy clay. Hard basalt rock formation was encountered underlying the alluvial soils and extended down to the maximum depth explored of about 14.7 feet below the existing ground surface.

2. We did not encounter groundwater in the borings at the time of our field exploration. However, it should be noted that groundwater levels are subject to

change due to rainfall, time of year, seasonal precipitation, surface water runoff, and other factors.

3. Based on the subsurface conditions encountered at the project site, we believe a concrete pad/mat foundation may be used to support the new fueling station. We anticipate the foundation soils may consist of the loose to medium dense silty sand encountered in our borings at the project site. To reduce the potential for differential settlement from non-uniform bearing conditions, we recommend placing a minimum 12-inch thick layer of aggregate subbase material below the concrete pad/mat foundations to provide a firm and unyielding bearing layer. The aggregate subbase material should be compacted to a minimum of 95 percent relative compaction.
4. Based on our field exploration and engineering analyses, an allowable bearing pressure of up to 2,500 pounds per square foot (psf) may be used for design of the concrete pad/mat foundation bearing on the 12-inch thick layer of aggregate subbase material. This bearing value is for dead-plus-live loads and may be increased by one-third ($\frac{1}{3}$) for transient loads, such as those caused by wind or seismic forces. The bottom of the concrete pad/mat foundation should be embedded a minimum of 24 inches below the lowest adjacent finished grade.
5. Based on our engineering analyses and the subsurface condition encountered, we recommend the new wash rack pavements consist of Portland cement concrete at least 6 inches thick overlying a minimum of 12 inches of aggregate subbase material. The aggregate subbase material should also be compacted to a minimum of 95 percent relative compaction.
6. In general, the excavated on-site soils may be re-used as a source of general fill provided they are free of vegetation, deleterious materials, and rock fragments greater than 3 inches in maximum dimension.
7. The construction plans and specifications for the project should be forwarded to us for review to determine whether the recommendations contained in this report are adequately reflected in those documents. If this review is not made, Kokua Geotech LLC cannot assume responsibility for misinterpretation of our recommendations.
8. Kokua Geotech LLC should also be retained to monitor the deep foundation system installation, site and subgrade preparation, fill and backfill placement, proof-rolling of pavement subgrade, aggregate base/subbase course placement and other aspects of earthwork construction to determine whether the recommendations of this report are followed. The recommendations presented herein are contingent upon such observations.

If the actual exposed subsurface soil conditions encountered during construction differ from those assumed or considered in this report, Kokua Geotech LLC should be contacted to review and/or revise the geotechnical recommendations presented herein.

Detailed discussion of our findings and geotechnical engineering recommendations are contained in the body of this report. We appreciate the opportunity to be of service for this project. Should you have any questions concerning this report, please contact our office.

Very truly yours,

Kokua Geotech LLC



Xiaobin (Tim) Lin, P.E.
President

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**GEOTECHNICAL ENGINEERING EXPLORATION
SITE IMPROVEMENTS AT DOT KAHULUI BASEYARD
650 PALAPALA DRIVE
TMK: (2) 3-8-079: 018 (POR.)
KAHULUI, MAUI, HAWAII**

SECTION 1.0 INTRODUCTION

We have performed a geotechnical engineering exploration for the *Site Improvements at DOT Kahului Baseyard* project in Kahului on the Island of Maui, Hawaii. The location of the project and general vicinity are shown on the Project Location Map, Plate 1.

The purpose of our exploration was to observe and evaluate the general subsurface conditions at accessible locations at the project site to formulate geotechnical recommendations to assist in the design of the project. This report summarizes the findings and presents our geotechnical recommendations resulting from our site reconnaissance, field exploration, laboratory testing, and engineering analyses for the project. The findings and recommendations presented herein are subject to the limitations noted at the end of this report.

1.1 PROJECT CONSIDERATIONS

The project generally involves improvements to the existing DOT Kahului Baseyard located at 650 Palapala Drive in Kahului on the Island of Maui, Hawaii. We understand the planned improvements generally include replacement of an existing wash rack and concrete pad at the existing fueling station and reconfiguration of parking areas and landscaping. A layout of the project site is shown on the Site Plan, Plate 2.

Based on the information provided, we understand the new concrete pad for the fueling station will have plan dimensions of approximately 20 feet by 30 feet and will generally support new equipment and two 5,000-gallon fuel tanks, each weighing about 90,000 pounds when filled. We understand the new wash rack being planned will generally be located on the northeastern portion of the baseyard. In addition, we understand a new drywell is being considered for the on-site management of storm water runoff at the near the new wash rack area.

A grading plan was not provided at the time this report was prepared. We envision site grading for the project to generally consist of cuts and fills associated with foundation construction, new pavements, and infrastructure installation at the project site.

1.2 PURPOSE AND SCOPE OF WORK

The purpose of our services was to generally explore and evaluate the subsurface soil conditions at accessible locations at the project site to provide geotechnical recommendations to assist in the design of the project. The work was performed in general accordance with our fee proposal dated March 18, 2020. The scope of work for this exploration included the following items:

1. Coordination of boring stake-out and utility clearances by our engineer.
2. Mobilization and demobilization of a truck-mounted drill rig to the project site and back.
3. Drilling and sampling of two boreholes extending to depths ranging from about 11.2 and 14.7 feet below the existing ground surface. In addition, collection of bulk samples of the near-surface soils for laboratory California Bearing Ratio (CBR) analyses.
4. Performance of one field permeability test at a selected location to evaluate the permeability characteristics of the subsurface materials to assist in the design of the on-site drywell system.
5. Coordination of the field exploration and logging of the boreholes and field permeability testing by our field engineer.
6. Laboratory testing of selected soil samples obtained during the field exploration as an aid in classifying the materials and evaluating their engineering properties.
7. Analyses of the field and laboratory data to formulate geotechnical recommendations to assist in the design of the project.
8. Preparation of this report summarizing our work on the project and presenting our findings and recommendations.
9. Coordination of our overall work on the project by our project engineer.
10. Quality assurance and client/design team consultation by our principal engineer.

SECTION 1.0 INTRODUCTION

11. Miscellaneous work efforts such as drafting, word processing, and clerical support.

Detailed descriptions of our field exploration methodology are presented in the following section and the Logs of Borings are presented in Appendix A. Results of the laboratory tests performed are presented in Appendix B. Results of the field permeability test performed are presented in Appendix C.

END OF INTRODUCTION

SECTION 2.0 SITE CHARACTERIZATION AND FINDINGS

2.1 GENERAL SITE GEOLOGY

The Island of Maui was built by two major volcanoes, the older West Maui and the more recent East Maui, also known as Haleakala. The Isthmus of Maui is a narrow, gently sloping plain located between these two volcanoes. The project site is located at the northern portion of this gently sloping plain. Based on the geologic maps of the Island of Maui (Stearns, 1939 and Sherrod and others, 2007), the general area of the project site is underlain by Lava Flows (Qkul) of the Kula Volcanic Series.

The Isthmus of Maui was created by lava flows from Haleakala ponding on West Maui. It is comprised of alluvium washed from the slopes of West Maui and Haleakala. The erosional processes were dominated by the detachment of soil and rock masses from the mountain walls, and the soil materials were transported downslope toward the Isthmus primarily by gravity as colluvium. Colluvial accumulations often consist of material that is generally deposited by gravity fall, rain wash and mudflow. Once these materials reached the stream in the central portion of a valley, alluvial processes became dominant, and the sediments were transported and deposited as alluvium.

Underlying the alluvial soil deposits are overlapping lava flows from the West Maui and Haleakala Volcanoes. The bulk of the Haleakala Shield was built during the late Pliocene and early Pleistocene Epoch by thinly bedded basaltic lava flows of the Honomanu Volcanic Series. During the Pleistocene Epoch, the characteristics of the lava changed to very hard, thickly bedded flows of andesitic composition. These lava flows have been grouped as the Kula Volcanic Series. Typically, the basalt rock formation consists of thinly to thickly bedded a'a and pahoehoe type lava flows.

The surface soils underlying the project sites are classified as Jaucus Sand (JcC) and Molokai Silty Clay Loam (MuA and MuB) by the U.S. Soil Conservation Service in their publication "Soil Survey of Islands of Kauai, Oahu, Maui, Molokai and Lanai, State of Hawaii" (1972). The

SECTION 2.0 SITE CHARACTERIZATION AND FINDINGS

Jaucas Sand (JcC) soil type is described as light brown, excessively drained, calcareous soils that occur in narrow strips on coastal plains adjacent to the ocean that developed in wind and water deposited sand from coral and seashells.

Conversely, Molokai Silty Clay Loam (MuA and MuB) is described as dark reddish brown, sticky and plastic silty clay loam that formed in material weathered from basic igneous rock. In addition, this soil has a low shrink swell potential and severe erosion hazard. Mass grading work and development along Palapala Drive have brought the project site to its present form.

2.2 SITE DESCRIPTION

The project site is located at the existing DOT Kahului Baseyard at 650 Palapala Drive in Kahului on the Island of Maui, Hawaii. We understand the project area is about 1.75 acres and is generally bordered by Mua Street to the north, Haleakala Highway to the south, existing parking areas to the south, Kuleana Street to the east, and existing parking and access road areas to the west.

At the time of our field exploration, the project site was generally occupied by the existing fuel station and maintenance, truck shed, and repair shop building structures. In addition, the site was generally covered by asphaltic concrete and Portland cement concrete pavements for parking and driveway areas and the existing wash rack.

Based on our field observations, the project site appears to gradually slope down from east to west. Based on a topographic survey map provided, we anticipate existing ground surface elevations at the site to range from about +31 to +25 feet Mean Sea Level (MSL) on the eastern and western portions of the site, respectively.

2.3 FIELD EXPLORATION

We explored the subsurface conditions at the project site by drilling and sampling two borings, designated as Boring Nos. 1 and 2, extending to depths of about 14.7 and 11.2 feet below the existing ground surface, respectively. The borings were drilled utilizing a truck-mounted drill rig equipped with continuous flight augers. The approximate boring locations are shown on the Site

Plan, Plate 2. It should be noted that each boring was terminated on apparent hard basalt rock formation that could not be penetrated by the drilling equipment.

Our engineer monitored the drilling operations on a near continuous (full-time) basis and classified the materials encountered in the borings by visual and textural examination in the field in general accordance with ASTM D2488. These classifications were further reviewed visually and by testing in the laboratory. Soils were classified in general accordance with ASTM D2487 and the Unified Soil Classification System. Graphic representations of the materials encountered are presented on the Logs of Borings in Appendix A.

Soil samples were obtained in general accordance with ASTM D1586 by driving a 2-inch OD standard penetration sampler with a 140-pound hammer falling 30 inches. In addition, relatively undisturbed soil samples were obtained in general accordance with ASTM D3550 by driving a 3-inch OD Modified California sampler using the same hammer and drop. The blow counts needed to drive the sampler the second and third 6 inches of an 18-inch drive are shown as the "Sampling Resistance" on the Logs of Borings at the appropriate sample depths. The blow counts may need to be factored to obtain the Standard Penetration Test (SPT) blow counts.

Pocket penetrometer tests were performed on selected cohesive soil samples retrieved in the field. The pocket penetrometer test provides an indication of the unconfined compressive strength of the sample. Pocket penetrometer test results are summarized on the Logs of Borings at the appropriate sample depths.

2.4 LABORATORY TESTING

Moisture Content (ASTM D2216) and Unit Weight (ASTM D2937) determinations were performed on selected samples as an aid in the classification and evaluation of soil properties. The test results are presented on the Logs of Borings at the appropriate sample depths.

Two Atterberg Limits tests (ASTM D4318) were performed on selected soil samples to evaluate the liquid and plastic limits. The samples tested had relatively low Plasticity Indices (PIs) of about 14 and 15 and plotted as low plasticity silt (ML) and low plasticity clay (CL) on a Standard

SECTION 2.0 SITE CHARACTERIZATION AND FINDINGS

Plasticity Chart. The test results are summarized on the Logs of Borings at the appropriate sample depth. Graphic presentations of the Atterberg Limits test results are provided on Plate B-1.

One Sieve Analysis test (ASTM C117 and C136) was performed on a selected soil sample to evaluate the gradation characteristics of the soil and to aid in soil classification. A graphic presentation of the grain size distribution is provided on Plate B-2.

Two one-inch ring swell tests were performed on relatively undisturbed (natural) and remolded samples to evaluate the swelling potential of the on-site soils. Swell test results of about 0.5 and 1.0 percent were observed, indicating the on-site soils have a low swelling potential when subjected to moisture fluctuations. The ring swell test results are summarized on Plate B-3.

One laboratory California Bearing Ratio (CBR) test (ASTM D1883) was performed on a mixture of bulk samples of the near-surface soils to evaluate the pavement support characteristics of the on-site soils. Results of our laboratory CBR test indicates the sample of on-site soils tested had a CBR value of about 12 with a corresponding swell of about 0.8 percent. The CBR test results are presented on Plate B-4.

2.5 SUBSURFACE CONDITIONS

Our borings generally encountered pavement structures consisting of about 3 and 5 inches of asphaltic concrete and about 3 and 6 inches of base material overlying alluvial soils and basalt rock formation extending down to the maximum depth explored of about 14.7 feet below the existing ground surface. The alluvial soils were encountered to depths of about 11 and 14.5 feet below the existing ground surface and generally consisted of loose to medium dense silty sand and stiff to very stiff sandy silt and sandy clay.

Hard basalt rock formation was encountered underlying the alluvial soils and extended down to the maximum depth explored of about 14.7 feet below the existing ground surface. We did not encounter groundwater in the borings at the time of our field exploration. However, it

SECTION 2.0 SITE CHARACTERIZATION AND FINDINGS

should be noted that groundwater levels are subject to change due to rainfall, time of year, seasonal precipitation, surface water runoff, and other factors.

2.6 SEISMIC DESIGN CONSIDERATIONS

Based on the International Building Code, 2006 Edition (IBC 2006) and American Society of Civil Engineers Standard ASCE/SEI 7-10 (ASCE 7-10), the project site may be subject to seismic activity, and seismic design considerations will need to be addressed. Based on the subsurface materials encountered at the project site, the geologic setting of the area, and our engineering analyses, we anticipate the project site may be classified from a seismic analysis standpoint as being a “Stiff Soil Profile” site corresponding to a Site Class D soil profile type based on the IBC 2006 (Table No. 1613.5.2).

Based on Site Class D, the following seismic design parameters were estimated and may be used for seismic analysis of the project.

SUMMARY OF SEISMIC DESIGN PARAMETERS	
Mapped MCE Spectral Response Acceleration, S_s	0.987g
Mapped MCE Spectral Response Acceleration, S_1	0.253g
Site Class	D
Site Coefficient, F_a	1.105
Site Coefficient, F_v	1.894
Design Spectral Response Acceleration, S_{D5}	0.727g
Design Spectral Response Acceleration, S_{D1}	0.319g
Peak Ground Acceleration, PGA	0.364g
Site Modified Peak Ground Acceleration, PGA_M	0.414g

Based on the subsurface conditions encountered, the phenomenon of soil liquefaction is not a design consideration for this project site.

END OF SITE CHARACTERIZATION AND FINDINGS

SECTION 3.0 DISCUSSION AND RECOMMENDATIONS

Based on the results from our field exploration, the project site is generally underlain by pavement structures consisting of about 3 and 5 inches of asphaltic concrete and about 3 and 6 inches of base material overlying alluvial soils and basalt rock formation extending down to the maximum depth explored of about 14.7 feet below the existing ground surface. The alluvial soils were encountered to depths of about 11 and 14.5 feet below the existing ground surface and generally consisted of loose to medium dense silty sand and stiff to very stiff sandy silt and sandy clay.

Hard basalt rock formation was encountered underlying the alluvial soils and extended down to the maximum depth explored of about 14.7 feet below the existing ground surface. We did not encounter groundwater in the borings at the time of our field exploration. However, it should be noted that groundwater levels are subject to change due to rainfall, time of year, seasonal precipitation, surface water runoff, and other factors.

We anticipate the foundation soils beneath the new fueling station concrete pad/mat foundation may consist of the loose to medium dense silty sand encountered in our borings at the project site. To reduce the potential for differential settlement from non-uniform bearing conditions, we recommend placing a minimum 12-inch thick layer of aggregate subbase material below the concrete pad/mat foundations to provide a firm and unyielding bearing layer. The aggregate subbase material should be compacted to a minimum of 95 percent relative compaction.

Based on our engineering analyses and the subsurface condition encountered, we recommend the new wash rack pavements consist of Portland cement concrete at least 6 inches thick overlying a minimum of 12 inches of aggregate subbase material. The aggregate subbase material should also be compacted to a minimum of 95 percent relative compaction. Aggregate subbase materials should consist of crushed basaltic aggregates and should meet the

requirements of Section 703.17 of the State of Hawaii, Standard Specifications for Road and Bridge Construction (2005).

Detailed discussion of these items and our geotechnical recommendations for design of fueling station foundations, site grading, pavements, and other geotechnical aspects of the project are further discussed in the following sections.

3.1 FUELING STATION FOUNDATIONS

Based on the subsurface conditions encountered at the project site, we believe a concrete pad/mat foundation may be used to support the new fueling station. We anticipate the foundation soils may consist of the loose to medium dense silty sand encountered in our borings at the project site. To reduce the potential for differential settlement from non-uniform bearing conditions, we recommend placing a minimum 12-inch thick layer of aggregate subbase material below the concrete pad/mat foundations to provide a firm and unyielding bearing layer. The aggregate subbase material should be compacted to a minimum of 95 percent relative compaction.

The over-excavated concrete pad/mat foundation subgrades (beneath the 12 inches of aggregate subbase material) should be scarified to a depth of 10 inches, moisture-conditioned to above the optimum moisture content, and recompact to at least 95 percent relative compaction. Soft and/or loose materials encountered at the bottom of the concrete pad/mat foundation excavations should be over-excavated to expose the underlying firm materials. The over-excavation should be backfilled with aggregate subbase material compacted to a minimum of 95 percent relative compaction.

Based on our field exploration and engineering analyses, an allowable bearing pressure of up to 2,500 pounds per square foot (psf) may be used for design of the concrete pad/mat foundation bearing on the 12-inch thick layer of aggregate subbase material. This bearing value is for dead-plus-live loads and may be increased by one-third ($\frac{1}{3}$) for transient loads, such as

those caused by wind or seismic forces. The bottom of the concrete pad/mat foundation should be embedded a minimum of 24 inches below the lowest adjacent finished grade.

The allowable bearing pressure provided above is a net value; therefore, the weight of the concrete pad/mat foundation may be discounted. In general, we recommend using a modulus of subgrade reaction of about 35 pounds per square inch per inch of deflection (pci) in the design of the concrete pad/mat foundation under long-term loading conditions. For transient loads, such as wind and/or seismic loading, the modulus of subgrade reaction may be increased to 60 pci in the design.

Based on our engineering analyses, we believe that total foundation settlements on the order of about 1 inch and differential settlements between the center and the edge of the concrete pad/mat to be on the order of about 0.5 inch or less are anticipated for the fueling station supported on the proposed concrete pad/mat foundation. We believe that a significant portion of the estimated settlements is elastic and should occur as the loads are applied.

Lateral loads acting on the structures may be resisted by friction developed between the bottom of the concrete pad/mat foundation and the bearing soils and by passive earth pressure acting against the near-vertical faces of the foundation system. A coefficient of friction of 0.4 may be used to evaluate the sliding resistance between the bottom of the concrete pad/mat foundation and the 12-inch thick layer of aggregate subbase material. Resistance due to passive earth pressure may be estimated using an equivalent fluid pressure of 300 pounds per square foot per foot of depth (pcf). This assumes that the backfill around the concrete pad/mat foundation is well-compacted. Unless covered by pavements or slabs, the passive resistance in the upper 12 inches of soil should be neglected.

Resistance to uplift loads may be mobilized by the dead weight of the structure and the concrete pad/mat foundation. In addition, the weight of the soil above the mat foundation may be used to resist uplift loads. Contribution of dead weight from the soil above the mat foundation may be estimated using a unit weight of 110 pounds per cubic foot (pcf).

A Kokua Geotech LLC representative should observe the concrete pad/mat foundation excavations prior to placement of the aggregate subbase materials, reinforcing steel, and concrete to confirm the foundation bearing conditions.

3.2 SOLAR CARPORT FOUNDATIONS

We understand solar carport structures are being considered for some of the parking areas at the project site. Based on preliminary information provided by the project structural engineer, we understand maximum loads for a typical interior column are estimated to be about 6 kips for dead load and 8 kips for the roof live load. We understand maximum shear and overturning moments have not been determined at this preliminary design phase of the project. Based on our experience with similar solar carport structures, we anticipate that the shear and overturning moment at the base of the structure column will govern the design of the drilled shaft foundation.

In order to develop the anticipated bearing and lateral load resistances, we recommend supporting the new solar carport structures on a foundation system consisting of cast-in-place concrete drilled shaft foundations. In general, drilled shaft foundations are constructed by drilling a hole down into the bearing strata, placing reinforcing steel, and then pumping high slump concrete to fill up the hole. The result is a cast-in-place concrete drilled shaft for foundation support.

Based on the anticipated structural load demands and the subsoil conditions encountered at the project site, we envision installing drilled shaft foundations with minimum diameters ranging from 18 to 24 inches and embedment lengths ranging from about 10 to 20 feet below the design finished grade to support the new solar carport structures planned for the project. We envision the drilled shaft foundations would derive vertical support primarily from skin friction between the drilled shaft and the surrounding materials and some end bearing on the very stiff clayey soils and/or basalt rock formation encountered in our borings drilled at the project site.

Lateral loads imposed on the drilled shaft foundations may be resisted by a combination of the passive pressure acting against the near-vertical faces of the foundation caps, if utilized, and the lateral load capacity of the drilled shaft foundation. Passive earth pressure against the near-vertical faces of the foundation caps may be estimated using an equivalent fluid pressure of 350 pounds per cubic foot (pcf).

Lateral load resistance of drilled shafts is a function of the stiffness of the surrounding soil, the stiffness of the drilled shaft, allowable deflection at the top of the drilled shaft, and the induced moment in the drilled shaft. Once the maximum shear and overturning moment loading are determined for the structures, lateral load analyses will be performed using the program *LPILE*, which is a special-purpose computer program that analyzes a deep foundation under lateral loading using the “p-y” method. This method uses non-linear “p-y” curves to represent soil moduli.

The above drilled shaft foundation recommendations are for preliminary design purposes only. Final drilled shaft diameters and depths must be approved by Kokua Geotech LLC. In addition, the construction plans and specifications for the project should be forwarded to us for review to determine whether the recommendations contained in this report are adequately reflected in those documents. If this review is not made, Kokua Geotech LLC cannot assume responsibility for misinterpretation of our recommendations.

3.3 SITE GRADING

A grading plan was not provided at the time this report was prepared. We envision site grading for the project to generally consist of cuts and fills associated with foundation construction, new pavements, and infrastructure installation at the project site. Site grading items that are addressed in the subsequent subsections include the following:

1. Site and Subgrade Preparation
2. Excavations
3. Fill/Backfill Materials
4. Fill/Backfill Compaction Requirements

A Kokua Geotech LLC representative should monitor site grading operations to observe whether undesirable materials are encountered during the excavation and subgrade preparation process, and to confirm whether the exposed soil conditions are similar to those assumed in this report.

3.3.1 SITE AND SUBGRADE PREPARATION

At the on-set of earthwork, areas within the contract grading limits should be cleared thoroughly. Surface vegetation, debris, deleterious materials, existing structures and pavements to be demolished, and other unsuitable materials should be removed and disposed of properly off-site.

After clearing and demolition, areas at grade or areas designated to receive fills should be scarified to a depth of about 10 inches, moisture-conditioned to above the optimum moisture content, and compacted to a minimum of 90 percent relative compaction. Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density as determined by ASTM D1557. Optimum moisture is the water content (percentage by weight) corresponding to the maximum dry density.

Soft and yielding areas encountered during clearing and subgrade preparation should be over-excavated to expose firm material, and the resulting excavation should be backfilled with well-compacted general fill. The excavated soft soils should be properly disposed of off-site and/or used in landscape areas, where appropriate.

3.3.2 EXCAVATIONS

All excavations should be made in accordance with applicable Occupational Safety and Health Administration (OSHA) and state regulations. The contractor should determine the method and equipment to be used for the excavations, subject to practical limits and safety considerations. In addition, the excavations should comply with the applicable federal, state, and local safety requirements. The contractor should be responsible for trench shoring design and installation.

SECTION 3.0 DISCUSSION AND RECOMMENDATIONS

Based on the information provided, we envision excavations for the project will generally consist of excavations for foundation construction and utility installation. Based on our borings, these excavations may encounter loose to medium dense sandy soils and stiff to very stiff sandy silt/clay. In addition, boulders and hard basalt rock formation may be encountered in the planned excavations.

It is anticipated that most of the material may be excavated with normal heavy excavation equipment. However, deep excavations and excavations encountering boulders and hard basalt rock formation may require the use of hoerams. Contractors should be encouraged to examine the site conditions and the subsurface data to make their own reasonable and prudent interpretation.

3.3.3 FILL/BACKFILL MATERIALS

In general, the excavated on-site soils may be re-used as a source of general fill provided they are free of vegetation, deleterious materials, and rock fragments greater than 3 inches in maximum dimension.

Imported fill materials, if required, should consist of non-expansive structural fill material, such as crushed coral or basalt. The structural fill should be well-graded from coarse to fine with particles no larger than 3 inches in largest dimension. The material should have a CBR value of 20 or higher and a swell potential of 1 percent or less when tested in accordance with ASTM D1883. The material should also contain between 10 and 30 percent particles passing the No. 200 sieve.

Aggregate base course and aggregate subbase materials should consist of crushed basaltic aggregates and should meet the requirements of Sections 703.06 and 703.17, respectively, of the State of Hawaii, Standard Specifications for Road and Bridge Construction (2005). Kokua Geotech LLC should test imported fill materials for conformance with these recommendations prior to delivery to the project site for the intended use.

3.3.4 FILL/BACKFILL COMPACTION REQUIREMENTS

General fill and structural fill materials should be moisture-conditioned to above the optimum moisture content, placed in level lifts not exceeding 8 inches in loose thickness, and compacted to a minimum of 90 percent relative compaction. Fills and backfills within 2 feet of the pavement grade elevation should be compacted to a minimum of 95 percent relative compaction.

Aggregate base and subbase course materials should be placed in level lifts of about 8 inches in loose thickness, moisture-conditioned to above the optimum moisture, and compacted to at least 95 percent relative compaction.

Relative compaction refers to the in-place dry density of soil expressed as a percentage of the maximum dry density of the same soil determined in accordance with ASTM D1557. Optimum moisture is the water content (percentage by dry weight) corresponding to the maximum dry density.

Site grading operations should be observed by a representative from Kokua Geotech LLC. It is important that a representative from our office observe the site grading operations to evaluate whether undesirable materials are encountered during the subgrade preparation process and whether the exposed soil/rock conditions are similar to those encountered in our field exploration.

3.4 FIELD PERMEABILITY TESTING

One field permeability test was conducted in the borehole of Boring No. 2 at a depth of about 10 feet below the existing ground surface to evaluate the infiltration characteristics of the subsurface materials encountered at the proposed drywell location. A falling head permeability test was performed in the drilled boring to determine the average hydraulic conductivity of the underlying subsurface materials. In general, clear water was introduced into the boring and the drop of the water level in the boring was measured along with time.

SECTION 3.0 DISCUSSION AND RECOMMENDATIONS

The field data for the falling head test was analyzed using formulae shown in “Seepage, Drainage and Flow Nets, 3rd Edition”, Cedergren, 1989. Based on the falling head field permeability test results, the estimated hydraulic conductivity (k) at the test location is summarized in the following table. The results of our field permeability test is presented in Appendix C.

FIELD PERMEABILITY TEST RESULTS			
<u>Test Location</u>	<u>Testing Depth</u> (feet)	<u>Estimated Hydraulic Conductivity</u>	
		(feet/minute)	(centimeters/second)
B-2	0 – 9	8.9×10^{-4}	4.5×10^{-4}

3.5 PAVEMENT DESIGN

We understand new asphaltic concrete (flexible) and Portland cement concrete (rigid) pavements are planned for portions of the parking and access road areas and the new wash rack. In general, we anticipate vehicle loading for the project will consist primarily of passenger vehicles and light trucks with some heavy trucks.

Detailed traffic projections for the new pavements were not provided at the time this report was prepared. Therefore, the following design parameters were assumed for preliminary pavement design purposes. In addition, we assume the pavement subgrade soils will consist of the alluvial soils encountered during our field exploration.

DESIGN TRAFFIC PARAMETERS	
Design Average Daily Traffic (Vehicles Per Day Per Direction)	500
Traffic Volume Growth Rate	2.0% each year
Design Period	30 Years
Total ESAL in 30 Years	1,000,000

SECTION 3.0 DISCUSSION AND RECOMMENDATIONS

Based on the above assumptions, we recommend using the following pavement design sections for preliminary design purposes:

Flexible Pavements for Parking Areas

4.0-Inch Asphaltic Concrete

8.0-Inch Aggregate Base Course (95 Percent Relative Compaction)

12.0-Inch Total Pavement Thickness on Moist Compacted Subgrade

Rigid Pavements

6.0-Inch Asphaltic Concrete

12.0-Inch Aggregate Subbase Course (95 Percent Relative Compaction)

18.0-Inch Total Pavement Thickness on Moist Compacted Subgrade

The pavement subgrade soils should be scarified to a minimum depth of about 10 inches, moisture-conditioned to above the optimum moisture content, and compacted to not less than 95 percent relative compaction. The subgrade soils should be thoroughly moistened and kept moist until covered by the pavement structural section.

Aggregate base and subbase course materials should be compacted to at least 95 percent relative compaction and meet the material requirements meet the requirements of the State of Hawaii, Standard Specifications for Road and Bridge Construction (2005). CBR and field density tests should be performed on the actual materials used during construction to confirm the adequacy of the above section. The recommended section also assumes that adequate drainage will be provided for the paved areas.

As an additional check for stability and uniform compaction, we recommend proof-rolling the pavement subgrade prior to placing the aggregate base/subbase course materials using a pneumatic tired vehicle with a gross vehicle weight of at least 30,000 pounds, such as a fully-loaded water truck. The equipment used for proof-rolling should be operated at a speed of about 300 feet per minute and make at least two passes over each area designated for proof-rolling. Proof-rolling should also be performed on successive lifts of aggregate base/subbase course materials. Areas with excessive rutting and/or pumping should be over

excavated to expose firm material, and the resulting excavation should be backfilled with well-compacted aggregate base course material.

Paved areas should be sloped, and drainage gradients should be maintained to carry the surface water off the site. Surface water ponding should not be allowed on the site during or after construction. Where concrete curbs are used to isolate landscaping in or adjacent to the pavement areas, we recommend that the curbs be extended a minimum of 2 inches into the soils below the subgrade to reduce the potential for appreciable landscape water migration into the pavement section.

3.6 UTILITY TRENCHES

We envision new underground utilities may be required for the project. As discussed above, all excavations should be made in accordance with applicable Occupational Safety and Health Administration (OSHA) and state regulations. The contractor should determine the method and equipment to be used for utility trench excavation, subject to practical limits and safety considerations. In addition, the trench excavations should comply with the applicable federal, state, and local safety requirements. The contractor should be responsible for trench shoring design and installation.

In general, we recommend providing granular bedding consisting of 6 inches of open-graded gravel, such as No. 3 Fine gravel (ASTM C33, No. 67 gradation), under the pipes for uniform support. In addition, open-graded gravel (ASTM C33, No. 67 gradation) should also be used for the initial trench backfill up to about 12 inches above the pipes to provide adequate support around the pipes. It is critical to use a free-draining material, such as open-graded gravel, to reduce the potential for formation of voids below the haunches of pipes and to provide adequate support for the sides of the pipes. Improper trench backfill could result in backfill settlement and pipe damage.

Trench backfill material above the open-graded gravel may consist of general fill materials (on-site soils) or structural fill material. The backfill should be placed in maximum 8-inch level

loose lifts and mechanically compacted to no less than 90 percent relative compaction to reduce the potential for appreciable future ground subsidence. The upper 2 feet below the finished grade in areas subjected to vehicular traffic should be compacted to a minimum of 95 percent relative compaction.

3.7 SITE DRAINAGE CONSIDERATIONS

The drainage condition around the building structures is critical to maintaining proper foundation performance because ponded water could cause subsurface soil saturation and subsequent heaving or loss of strength. Finished grades outside the new structures should be sloped to shed water away from the slab and foundations and to reduce the potential for ponding around the structures.

Drainage systems and finished grades for the project site should be designed by a Licensed Civil Engineer so that surface runoff is directed away from the building and other related structures. Drainage swales should be provided as soon as possible and should be maintained to drain surface water runoff away from the slab and foundations. The foundation excavations should be properly backfilled against the walls or slab edges immediately after setting of the concrete to reduce the potential for excessive water infiltration into the subsurface.

3.8 DESIGN REVIEW AND CONSTRUCTION OBSERVATION SERVICES

The construction plans and specifications for the project should be forwarded to us for review to determine whether the recommendations contained in this report are adequately reflected in those documents. If this review is not made, Kokua Geotech LLC cannot assume responsibility for misinterpretation of our recommendations.

Kokua Geotech LLC should also be retained to monitor the foundation excavations, site and subgrade preparation, fill and backfill placement, proof-rolling of pavement subgrade, aggregate base/subbase course placement and other aspects of earthwork construction to determine whether the recommendations of this report are followed. The recommendations presented herein are contingent upon such observations. If the actual exposed subsurface soil

SECTION 3.0 DISCUSSION AND RECOMMENDATIONS

conditions encountered during construction differ from those assumed or considered in this report, Kokua Geotech LLC should be contacted to review and/or revise the geotechnical recommendations presented herein.

END OF DISCUSSION AND RECOMMENDATIONS

SECTION 4.0 LIMITATIONS

This report has been prepared for the exclusive use of EnviroServices & Training Center, LLC and their project consultants for specific application to the design of the *Site Improvements at DOT Kahului Baseyard* project in accordance with generally accepted geotechnical engineering principles and practices. No warranty is expressed or implied. If any part of the project concept is altered or if subsurface conditions differ from those described in this report, then the information presented herein shall be considered invalid, unless the changes are reviewed, and any supplemental or revised recommendations issued in writing by Kokua Geotech LLC.

The analyses and report recommendations are based in part upon information obtained from the field borings and the assumption that subsurface conditions do not vary significantly from those observed in the borings. Variations of the subsurface conditions between and beyond the field borings may occur, and the nature and extent of these variations may not become evident until construction is underway. If variations then appear evident, Kokua Geotech LLC should be notified so that we can re-evaluate the recommendations presented herein.

The owner/client should be aware that unanticipated soil conditions are commonly encountered. Unforeseen subsurface conditions, such as perched groundwater, soft deposits, hard layers or cavities, may occur in localized areas and may require additional probing or corrections in the field (which may result in construction delays) to attain a properly constructed project. Therefore, a sufficient contingency fund is recommended to accommodate these possible extra costs.

The field boring locations indicated herein are approximate, having been estimated by taping from visible features shown on the Topographic Survey Map transmitted by The Limtiaco Consulting Group on March 16, 2020. The elevations of the field borings were estimated from contours and spot elevations shown on the same plan. The field boring locations and elevations should be considered accurate only to the degree implied by the methods used.

SECTION 4.0 LIMITATIONS

The stratification breaks shown on the graphic representations of the borings depict the approximate boundaries between soil types and, as such, may denote a gradual transition. We did not encounter groundwater in the borings at the time of our field exploration. However, it should be noted that groundwater levels are subject to change due to rainfall, time of year, seasonal precipitation, surface water runoff, and other factors. These data have been reviewed and interpretations made in the formulation of this report.

This report has been prepared solely for the purpose of assisting the architect and design engineers in the design of the project. Therefore, this report may not contain sufficient data, or the proper information, to serve as a basis for detailed construction cost estimates.

This geotechnical engineering exploration conducted at the project site was not intended to investigate the potential presence of hazardous materials existing at the project site. It should be noted that the equipment, techniques, and personnel used to conduct a geo-environmental exploration differ substantially from those applied in geotechnical engineering.

END OF LIMITATIONS

CLOSURE

The following plates and appendices are attached and complete this report:

Project Location Map..... Plate 1
Site Plan..... Plate 2
Logs of Borings Appendix A
Laboratory Test Results Appendix B
Field Permeability Test Results..... Appendix C

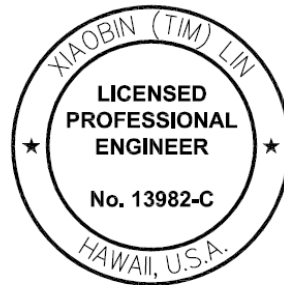
This report concludes our scope of work outlined in our fee proposal dated March 18, 2020. If you have any questions regarding this report or if any part of the report is not clear, please contact our office.

Respectfully submitted,

Kokua Geotech LLC



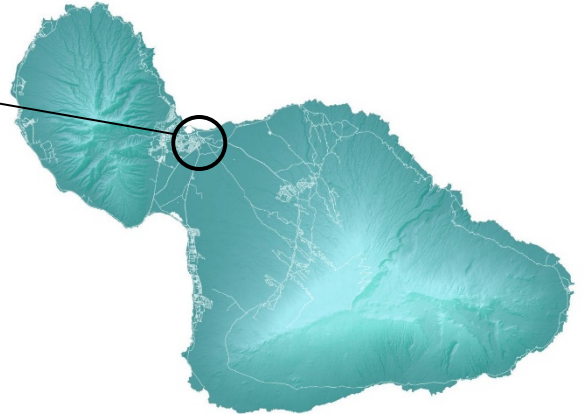
Xiaobin (Tim) Lin, P.E.
President



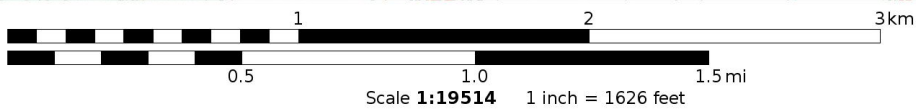
THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION.
(MY LICENSE EXPIRES 4/30/2022)

PLATES

GENERAL PROJECT LOCATION



Mercator Projection
WGS84
USNG Zone 4QGJ
CalTopo



PROJECT LOCATION MAP

SITE IMPROVEMENTS AT DOT KAHULUI BASEYARD
650 PALAPALA DRIVE
TMK: (2) 3-8-079: 018 (POR.)
KAHULUI, MAUI, HAWAII

PROJECT NO.: 031620-00

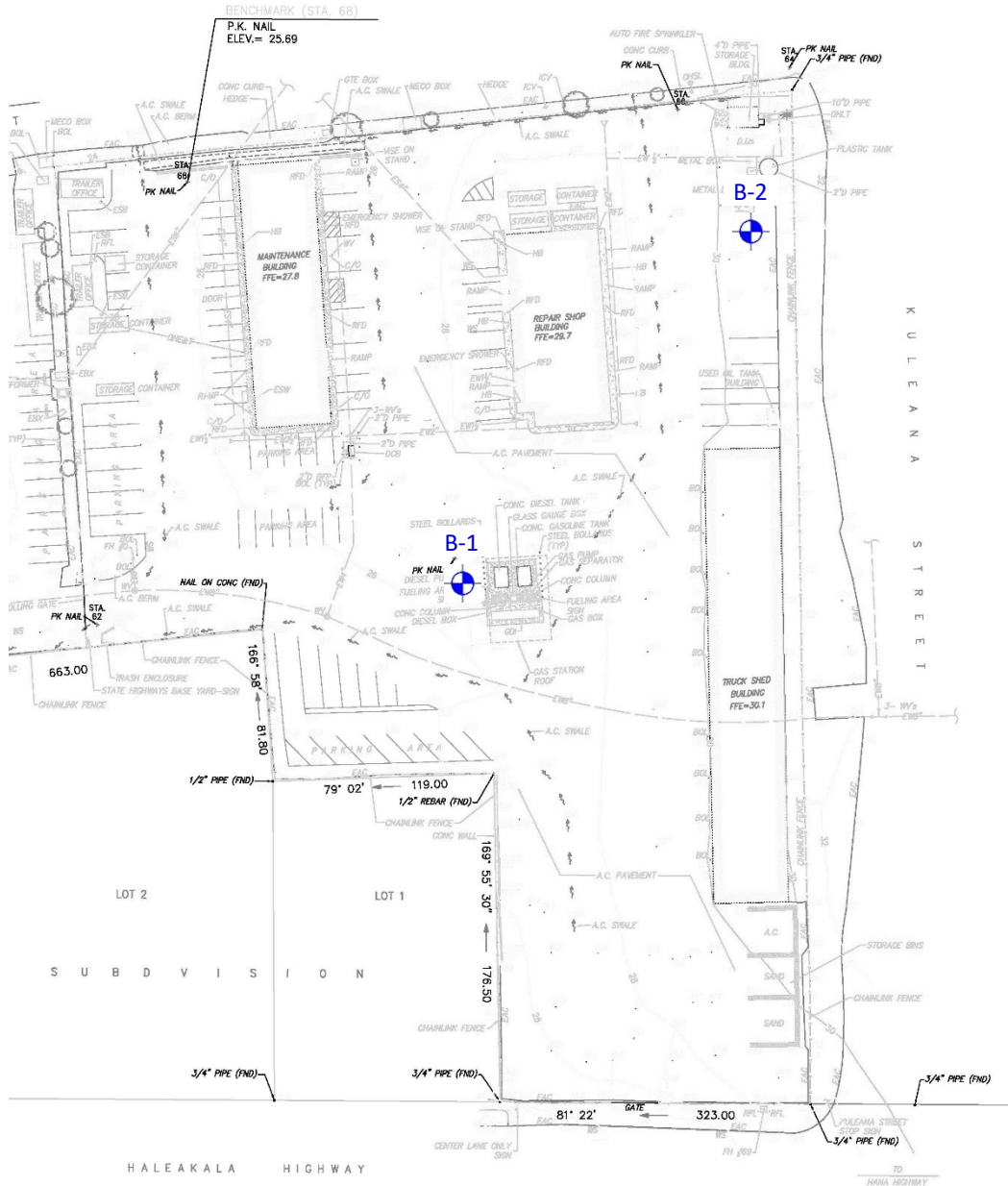
DATE: AUGUST 2020

PLATE

1

LOT 1-B
22.441 Acres

N



REFERENCE: TOPOGRAPHIC SURVEY MAP TRANSMITTED BY THE
LIMITIACO CONSULTING GROUP ON MARCH 16, 2020

SCALE: 1 INCH = APPROX. 100 FEET

 APPROXIMATE BORING LOCATION



SITE PLAN
SITE IMPROVEMENTS AT DOT KAHULUI BASEYARD
650 PALAPALA DRIVE
TMK: (2) 3-8-079: 018 (POR.)
KAHULUI, MAUI, HAWAII

PROJECT NO.: 031620-00

PLATE
2

DATE: AUGUST 2020

APPENDIX A

Project: Site Improvements at
DOT Kahului Baseyard
Project Location: Kahului, Maui, Hawaii
Project Number: 031620-00

Kokua Geotech LLC
94-974 Pakela Street, Suite 109
Waipahu, HI 96797
(808) 397-6974

Key to Logs of Borings
Sheet 1 of 1

1	2	3	4	5	6	7	8	9	10	11	12
Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	U.S.C.S	Graphic Log	MATERIAL DESCRIPTION	Pocket Pen./Torvane, tsf	Water Content, %	Dry Unit Weight, pcf	Remarks and Other Tests








COLUMN DESCRIPTIONS

- 1** Elevation (feet): Elevation (MSL, feet).
- 2** Depth (feet): Depth in feet below the ground surface.
- 3** Sample Type: Type of soil sample collected at the depth interval shown.
- 4** Sample Number: Sample identification number.
- 5** Sampling Resistance, blows/ft: Number of blows to advance driven sampler one foot (or distance shown) beyond seating interval using the hammer identified on the boring log.
- 6** U.S.C.S: Type of material encountered.
- 7** Graphic Log: Graphic depiction of the subsurface material encountered.
- 8** MATERIAL DESCRIPTION: Description of material encountered. May include consistency, moisture, color, and other descriptive text.
- 9** Pocket Pen./Torvane, tsf: the reading from Pockect Penetrometer or Torvane.
- 10** Water Content, %: Water content of the soil sample, expressed as percentage of dry weight of sample.
- 11** Dry Unit Weight, pcf: Dry weight per unit volume of soil sample measured in laboratory, in pounds per cubic foot.
- 12** Remarks and Other Tests: Other Tests







FIELD AND LABORATORY TEST ABBREVIATIONS

- CHEM: Chemical tests to assess corrosivity
- COMP: Compaction test
- CONS: One-dimensional consolidation test
- LL: Liquid Limit, percent
- PI: Plasticity Index, percent
- SA: Sieve analysis (percent passing No. 200 Sieve)
- UC: Unconfined compressive strength test, Qu, in ksf
- WA: Wash sieve (percent passing No. 200 Sieve)






MATERIAL GRAPHIC SYMBOLS

-  Asphaltic Concrete (AC)
-  Basalt Rock Formation
-  Lean CLAY, CLAY w/SAND, SANDY CLAY (CL)
-  Poorly graded GRAVEL with Silt (GP-GM)
-  SILT, SILT w/SAND, SANDY SILT (ML)
-  Silty SAND (SM)
-  Poorly graded SAND with Silt (SP-SM)

TYPICAL SAMPLER GRAPHIC SYMBOLS

-  Auger sampler
-  3-inch OD Modified California w/ brass liners
-  Grab Sample
-  PQ Coring
-  Probing w/ Pointed Tip
-  2-inch OD unlined split spoon (SPT)

OTHER GRAPHIC SYMBOLS

-  Water level (at time of drilling, ATD)
-  Water level (after waiting)
-  Minor change in material properties within a stratum
-  Inferred/gradational contact between strata
-  Queried contact between strata

GENERAL NOTES

- 1: Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
- 2: Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

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Project: Site Improvements at DOT Kahului Baseyard	Kokua Geotech LLC 94-974 Pakela Street, Suite 109 Waipahu, HI 96797 (808) 397-6974	Log of Boring No. 1 Sheet 1 of 1
Project Location: Kahului, Maui, Hawaii		
Project Number: 031620-00		

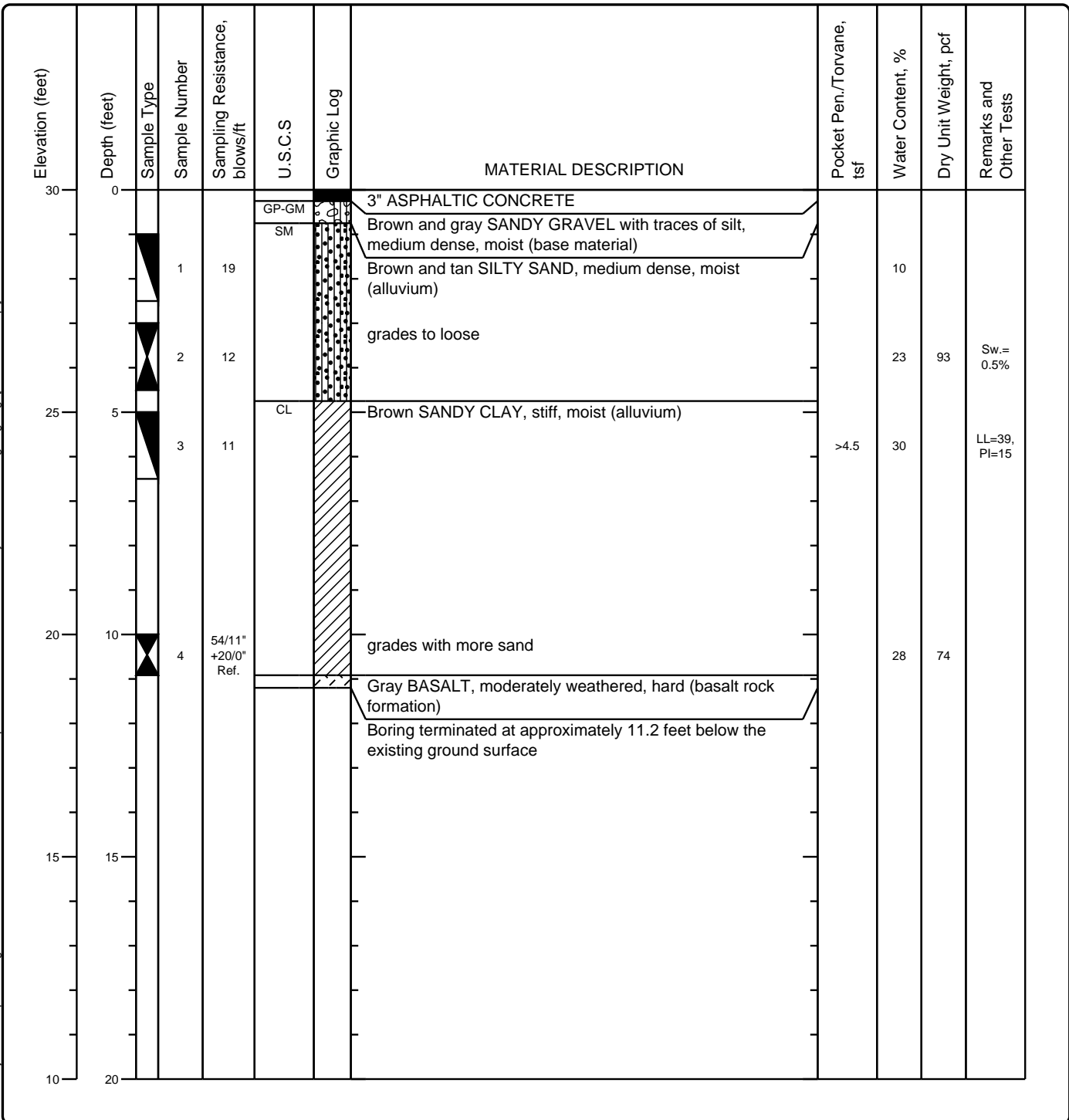
Date(s) Drilled: 7/15/2020	Logged By: SL	Checked By: AJF/TL
Drilling Method: CF Auger	Drill Bit Size/Type: 4-inch Solid Stem Auger	Total Depth of Borehole: 14.7 feet
Drill Rig Type: Mobile B-53	Drilling Contractor: Island Geotech	Approximate Surface Elevation: +27 feet MSL*
Groundwater Level and Date Measured: Not Encountered	Sampling Method(s): MCS & SPT	Hammer Data: 140 lbs. with 30-inch drop
Borehole Backfill: Soil Cuttings and AC	Location: See Site Plan (Plate 2)	

Elevation (feet)	Depth (feet)	Sample Type	Sample Number	Sampling Resistance, blows/ft	U.S.C.S	Graphic Log	MATERIAL DESCRIPTION	Pocket Pen./Torvane, tsf	Water Content, %	Dry Unit Weight, pcf	Remarks and Other Tests
27	0						5" ASPHALTIC CONCRETE				
			1	16	GP-GM SP-SM		Gray and brown SANDY GRAVEL with a little silt, medium dense, moist (base material)				Sieve #200= 10.6%
			2	10	ML		Brown SANDY SILT, stiff, moist (alluvium)		25		Sw.= 1.0%
22	5		3	27			grades to dark brown	>4.5	27	95	
			4	26	ML		Gray with multi-color mottling SANDY SILT with traces of gravel, very stiff, moist (alluvium)		34		LL=41, PI=14
17	10						Gray BASALT, moderately weathered, hard (basalt rock formation)		4		
12	15		5	30/1" Ref.			Boring terminated at approximately 14.7 feet below the existing ground surface				
							*Elevations of borings estimated from Topographic Survey Map transmitted by The Limtiaco Consulting Group on March 16, 2020				
7	20										

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Project: Site Improvements at DOT Kahului Baseyard	Kokua Geotech LLC 94-974 Pakela Street, Suite 109 Waipahu, HI 96797 (808) 397-6974	Log of Boring No. 2 Sheet 1 of 1
Project Location: Kahului, Maui, Hawaii		
Project Number: 031620-00		

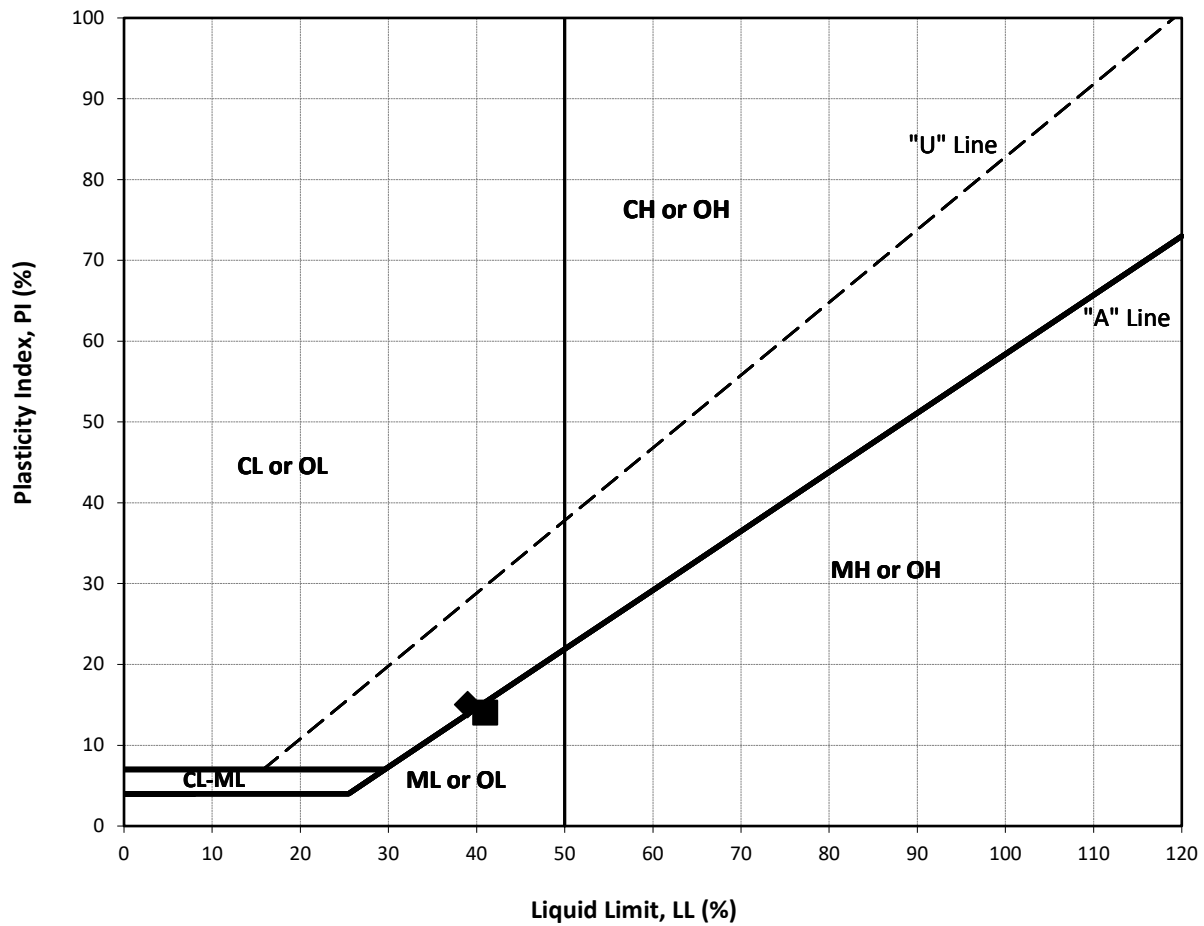
Date(s) Drilled: 7/15/2020	Logged By: SL	Checked By: AJF/TL
Drilling Method: CF Auger	Drill Bit Size/Type: 4-inch Solid Stem Auger	Total Depth of Borehole: 11.2 feet
Drill Rig Type: Mobile B-53	Drilling Contractor: Island Geotech	Approximate Surface Elevation: +30 feet MSL*
Groundwater Level and Date Measured: Not Encountered	Sampling Method(s): MCS & SPT	Hammer Data: 140 lbs. with 30-inch drop
Borehole Backfill: Soil Cuttings and AC	Location: See Site Plan (Plate 2)	



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APPENDIX B

PLASTICITY CHART



Symbol	Sample	Depth (feet)	Material Description	USCS	LL	PL	PI
■	B-1	10.0 to 11.5	Gray w/m.c. mottling SANDY SILT with traces of gravel	ML	41	27	14
◆	B-2	5.0 to 6.5	Brown SANDY CLAY	CL	39	24	15

SUMMARY OF ATTERBERG LIMITS (ASTM D4318) TEST RESULTS

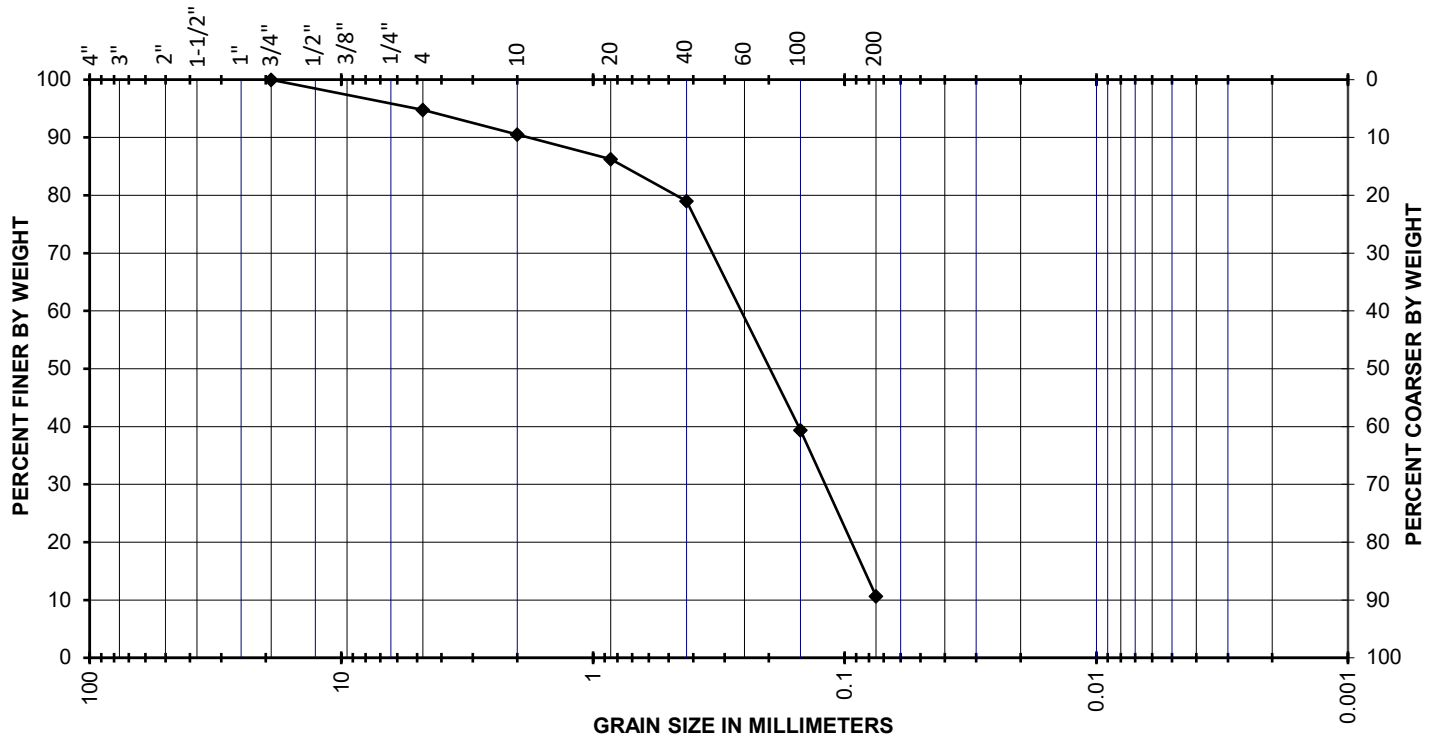
SITE IMPROVEMENTS AT DOT KAHULUI BASEYARD
 650 PALAPALA DRIVE
 TMK: (2) 3-8-079: 018 (POR.)
 KAHULUI, MAUI, HAWAII

PROJECT NO.: 031620-00

DATE: AUGUST 2020

**PLATE
B-1**

SIEVE ANALYSIS		HYDROMETER ANALYSIS
SIZE OF OPENING IN INCHES	NUMBER OF MESH PER INCH, U.S.	GRAIN SIZE IN MM



COARSE	FINE	COARSE	MEDIUM	FINE	FINES
GRAVEL		SAND			

Symbol	Sample	Depth	USCS	Description
		(feet)		
■	B-1	1.0 to 2.5	SP-SM	Brown and tan SAND with a little silt and gravel

SUMMARY OF GRAIN SIZE DISTRIBUTION (ASTM C117 & C136) TEST RESULTS

SITE IMPROVEMENTS AT DOT KAHULUI BASEYARD
 650 PALAPALA DRIVE
 TMK: (2) 3-8-079: 018 (POR.)
 KAHULUI, MAUI, HAWAII



PROJECT NO.: 031620-00

DATE: AUGUST 2020

PLATE
B-2

<u>Location</u>	<u>Depth</u> (feet)	<u>Test Type</u>	<u>Soil Description</u>	<u>Dry Density</u> (pcf)	<u>Moisture Contents</u>			<u>Ring Swell</u> (%)
					<u>Initial</u> (%)	<u>Air-Dried</u> (%)	<u>Final</u> (%)	
B-1	3.0 to 4.5	Remolded	Brown SANDY SILT	82.0	31.5	20.9	33.2	1.0
B-2	3.0 to 4.5	Natural	Brown and tan SILTY SAND	92.9	23.1	20.8	30.5	0.5

Note: Samples tested were either relatively undisturbed or remolded in 2.4-inch diameter by 1-inch high rings. Samples were then air-dried overnight followed by saturating for a minimum of 24 hours under a surcharge pressure of 60 psf.

SUMMARY OF RING SWELL TEST RESULTS

SITE IMPROVEMENTS AT DOT KAHULUI BASEYARD
650 PALAPALA DRIVE
TMK: (2) 3-8-079: 018 (POR.)
KAHULUI, MAUI, HAWAII

PROJECT NO.: 031620-00

DATE: AUGUST 2020

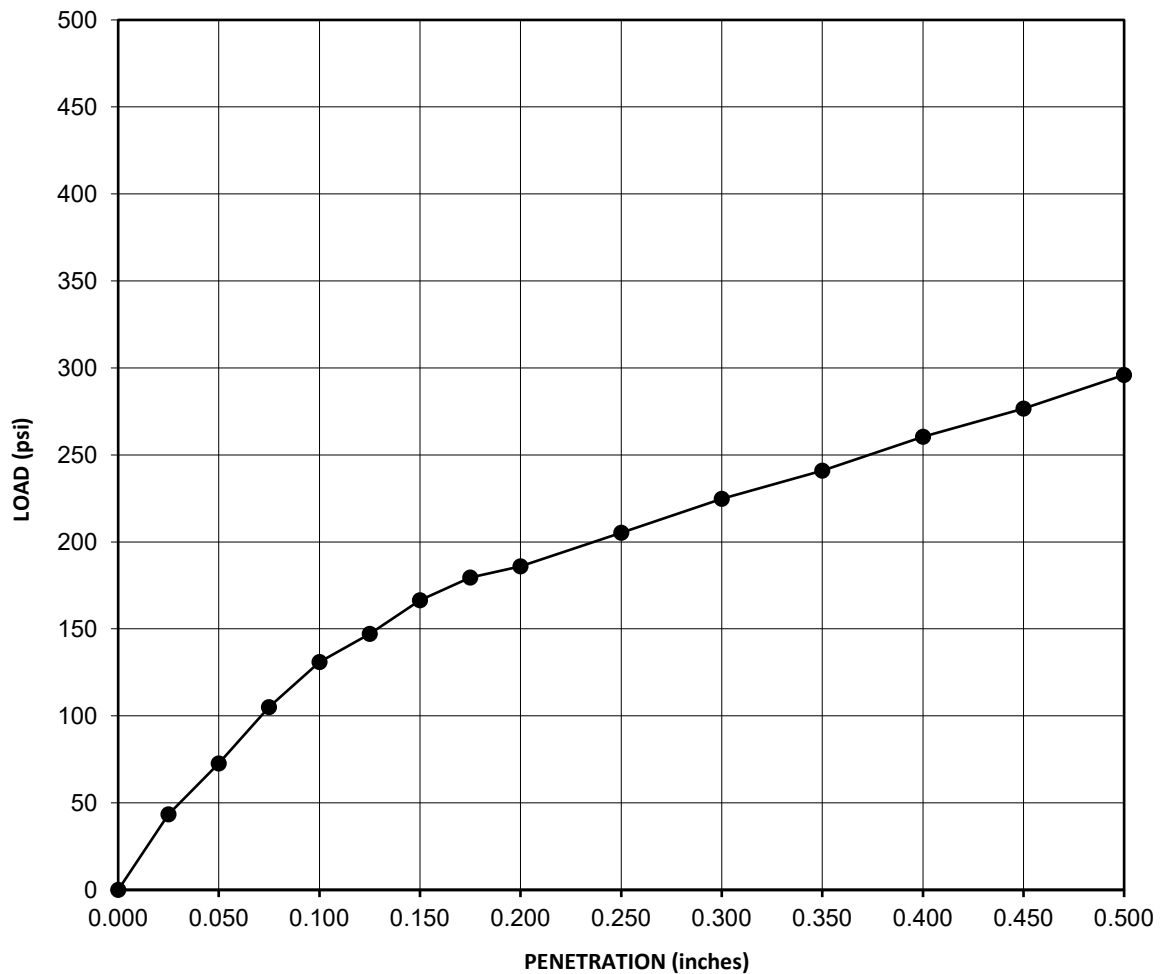
PLATE

B-3



Kokua Geotech LLC

Soil and Foundation Engineering



Location: BULK-1 (Mixture of B-1 and B-2)
 Depth: 1 to 5 feet
 Description: Brown CLAYEY SAND with a little gravel

Molding Dry Density: 90.2
 Molding Moisture: 27.4 %
 Days Soaked: 4
 Aggregate: ¾-inch minus

Corrected CBR @ 0.1": 13.1
 Corrected CBR @ 0.2": 12.4
 Swell (%): 0.8

SUMMARY OF CALIFORNIA BEARING RATIO (ASTM D1883) TEST RESULTS

SITE IMPROVEMENTS AT DOT KAHULUI BASEYARD
 650 PALAPALA DRIVE
 TMK: (2) 3-8-079: 018 (POR.)
 KAHULUI, MAUI, HAWAII

APPENDIX C

FIELD PERMEABILITY TEST CALCULATION SHEET

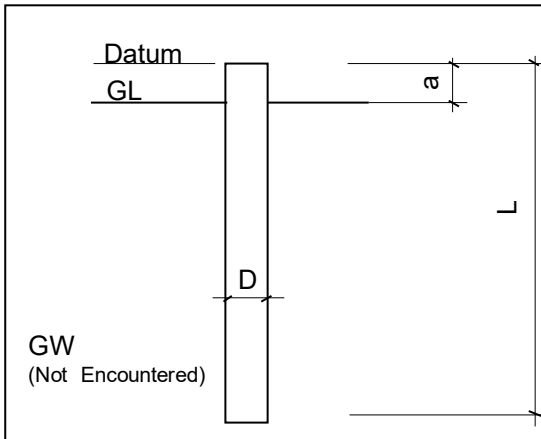
(FALLING HEAD METHOD: OPEN HOLE IN UNIFORM SOIL)

Site Improvements at DOT Kahului Baseyard

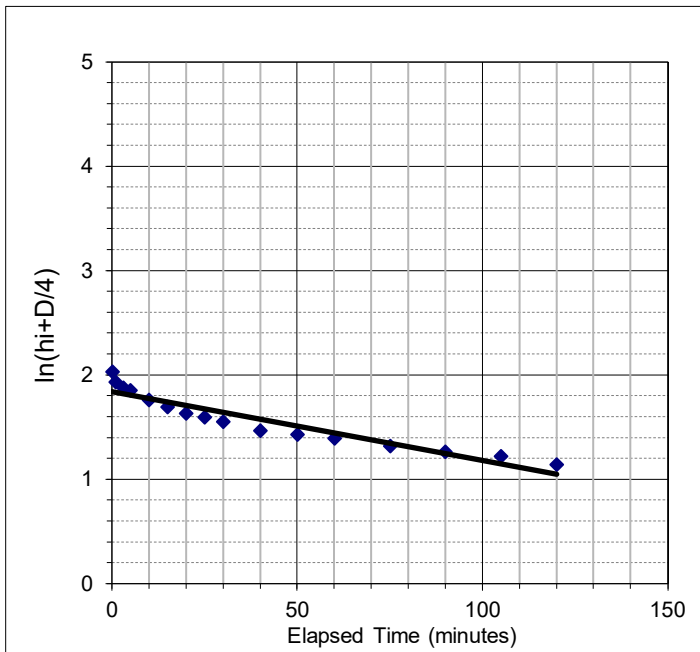
650 Palapala Drive

TMK: (2) 3-8-079: 018

Kahului, Maui, Hawaii



Boring:	B-2
GW table, (not encountered):	N/A feet
Datum, a (above ground):	0.00 feet
Open hole Length, L:	10.00 feet
Diameter of open hole (D):	6.5 inches
Factor of m ($\sqrt{\frac{k_h}{k_v}}$)	1.00



Time (min)	Depth of water (from datum) (feet)	ln(h _i +D/4)
0.0	2.50	2.03
1.0	3.20	1.94
3.0	3.60	1.88
5.0	3.75	1.85
10.0	4.30	1.76
15.0	4.70	1.69
20.0	5.00	1.64
25.0	5.20	1.60
30.0	5.40	1.56
40.0	5.80	1.47
50.0	5.95	1.43
60.0	6.10	1.40
75.0	6.38	1.32
90.0	6.60	1.26
105.0	6.75	1.22
120.0	7.00	1.14

Constant factor of the trendline y = Slope *x+c

$$\text{Slope: } \frac{\ln\left(h_i + \frac{D}{4}\right) - \ln\left(h_{i+1} + \frac{D}{4}\right)}{t_{i+1} - t_i} = \boxed{-0.007} \quad K_{fs} = \frac{D}{4} \times \frac{\left[\ln\left(h_i + \frac{D}{4}\right) - \ln\left(h_{i+1} + \frac{D}{4}\right)\right]^{30}}{t_{i+1} - t_i}$$

8.9E-04 ft/min
4.5E-04 cm/s