

Division of Forestry and Wildlife

State of Hawaii  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION  
Honolulu, Hawaii

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BOARD OF LAND AND NATURAL RESOURCES

Suzanne D. Case  
Chairperson

CONTRACT SPECIFICATIONS AND PLANS

Job No. D00CO61A  
Makiki Valley Trail  
Pedestrian Bridge Replacement  
Honolulu, Oahu, Hawaii

Prime Consultant: Randal S. Furomoto & Associates, Inc.



June 2015

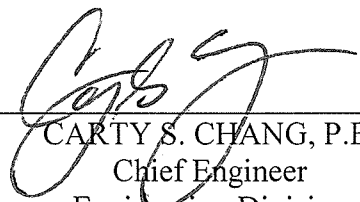
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DEPARTMENT OF LAND AND NATURAL RESOURCES  
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CONTRACT SPECIFICATIONS AND PLANS

Job No. D00CO61A  
Makiki Valley Trail  
Pedestrian Bridge Replacement  
Honolulu, Oahu, Hawaii

Approved:    
for LISA J. HADWAY  
Administrator  
Division of Forestry and Wildlife

Approved:   
CARTY S. CHANG, P.E.  
Chief Engineer  
Engineering Division

June 2015

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PLANS (Bound Separately)

DEPARTMENT OF LAND AND NATURAL RESOURCES INTERIM GENERAL  
CONDITIONS, DATED OCTOBER 1994. (Included on project CD, or bound separately)

**NOTICE TO BIDDERS**  
(Chapter 103D, HRS)

COMPETITIVE BIDS for Job No. **D00CO61A, Makiki Valley Trail, Pedestrian Bridge Replacement, Honolulu, Oahu, Hawaii** shall be submitted to the Department of Land and Natural Resources, Engineering Division on the specified date and time through the Hawaii State e-Procurement (HIePRO). HIePRO is accessible through the State Procurement Office website at [www.spo.hawaii.gov](http://www.spo.hawaii.gov).

The Department of Land and Natural Resources Interim General Conditions dated October 1994, as amended, is available on request; and the General Conditions – AG008, latest revision shall be made part of the specifications. An electronic copy of the General Conditions is available on the State Procurement Office website at <http://spo.hawaii.gov/wp-content/uploads/2013/12/ag008.pdf>.

The project is located at Makiki Valley Trail, Vicinity of Herring Springs, Honolulu, Oahu, Hawaii.

The work shall generally consist of the construction of a new pedestrian bridge including, but not limited to, mobilization and demobilization; Best Management Practices; clearing and grubbing; demolition and removal; grading and earthwork; construction of single span pedestrian bridge with concrete abutments and wood railings; and other related and appurtenant work.

Due to the nature of work contemplated, bidders must possess a valid State Contractor's license, classification A.

A pre-bid conference and State conducted site visit will be held at the Division of Forestry and Wildlife, Oahu Branch, Makiki Base Yard, located at 2135 Makiki Heights Drive on July 30, 2015 at 10:00 AM. For access to the Makiki Base Yard, press the black button on the gate activator. Attendance of the pre-bid conference and site visit is recommended, but not mandatory.

The estimated cost of construction is \$125,000.

As a condition of award of the contract and final payment, the vendor shall provide proof of compliance with the requirement of 103D-310(c) HRS. Proof of compliance/documentation is obtained through Hawaii Compliance Express (HCE). Vendors shall register in HCE, a program separate from HIePRO. The annual subscription fee to utilize the HCE service is currently \$12.00. Allow 2 weeks to obtain complete compliance status after initial registration. It is highly recommended that vendors subscribe to HCE prior to responding to a solicitation. The vendor is responsible for maintaining compliance. If the vendor does not maintain timely compliance in HCE, an offer otherwise deemed responsive and responsible may not be awarded. See HIePRO Buyer FAQ on the State Procurement Office website for more information.

**Vendors are required to be compliant with all of the requirements of 103D-310(c) HRS at the specified response due date (August 20, 2015). The proof of compliance/documentation will be verified through the Hawaii Compliance Express. Failure to be fully compliant at the specified response date shall deem the vendor's bid to be non-responsive and vendor's bid will be rejected.**

The award of the contract, if it be awarded, will be subject to the availability of funds.

This project is subject to preference to Hawaii Products established by Section 103D, Hawaii Revised Statutes. The Hawaii Product List may be examined at the State Procurement Office website.

Should there be any questions, please refer to the HiePRO solicitation.

# INFORMATION AND INSTRUCTIONS TO BIDDERS

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## INFORMATION AND INSTRUCTIONS TO BIDDERS

- A. PROJECT LOCATION AND SCOPE OF WORK: The project location and scope of work shall be as generally described in the Notice to Bidders.
- B. SEALED PROPOSALS: Bidders shall submit their "Sealed Bid", including the completed proposal form, bid bond, Qualification Questionnaire and any other documents required by the solicitation as part of their bid through the State of Hawaii e-Procurement System (HIePRO).
- C. GENERAL CONDITIONS: The Department of Land and Natural Resources Interim General Conditions dated October 1994, as amended, shall be made a part of these contract specifications and are referred to hereafter as the General Conditions.
- D. PROPOSAL FORM: **The Bidders shall fill out and upload the electronic copy of the proposal form to the HIePRO website when submitting the bid. Bid Proposals shall not be mailed, faxed or delivered to the State, unless requested to do so after the designated closing date. The successful Bidder shall fill out and print a hard copy of the proposal form, sign and submit the form with contract award package.**
- E. OMISSIONS OR ERASURES: Any proposal which contains any omission or erasure or alteration not properly initialed, or conditional bid, or other irregularity may be rejected by the Board of Land and Natural Resources (Board).
- F. NOTICE OF INTENT TO BID AND QUESTIONNAIRE:  
A Notice of Intent to Bid is not required for this project. In compliance with HRS Section 103D-310, the lowest responsive and responsible bidder may be required to complete a standard questionnaire. When required, the completed questionnaire shall be submitted to the Chief Engineer for evaluation. Failure to furnish the requested information within the time allowed may be grounds for a determination of non-responsibility, in accordance with HRS Section 103D-310 and HAR Section 3-122-108.
- G. BID SECURITY: A bid security will be furnished by each bidder as provided in sub-section 2.7 of the General Conditions. The successful bidder's bid security will be retained until Contract execution and furnished a performance and payment bond in an amount equal to one hundred percent (100%) of the total Contract price, including an amount estimated to be required for extra work, is furnished.

The Board reserves the right to hold the bid securities of the two lowest bidders until the successful bidder has entered into a contract and has furnished the required performance bond. All bid securities will be returned after bid opening and checking of the proposals are checked in accordance with sub-section 3.5 of the General Conditions.

Should the successful bidder fail to enter into a contract and furnish a satisfactory performance bond within the time stated in the proposal, the bid security shall be forfeited as required by law.

- H. CONTRACTOR'S LICENSE REQUIRED: The Board will reject all bids received from contractors who have not been licensed by the State Contractors License Board in accordance with Chapter 444, HRS; Title 16, Chapter 77, Hawaii Administrative Rules; and statutes amendatory thereto.
- I. IRREGULAR BIDS: No irregular bids or propositions for doing the work will be considered by the Board.
- J. WITHDRAWAL OF BIDS: No bidder may withdraw his bid between the time of the opening thereof and the award of contract.
- K. SUCCESSFUL BIDDER TO FILE PERFORMANCE AND PAYMENT BONDS: The successful bidder will be required to file performance and payment bonds each; in the amount equal to the total contract price, including amounts estimated to be required for extra work, as provided in sub-section 3.6 of the General Conditions.
- L. NUMBER OF EXECUTED ORIGINAL COUNTERPARTS OF CONTRACT DOCUMENTS: If requested by the Board, six copies of the Contract, performance and payment bonds shall be executed.
- M. CHANGE ORDERS: No work of any kind in connection with the work covered by the plans and specifications shall be considered as change order work, or entitle the Contractor to extra compensation, except when the work has been ordered in writing by the Chief Engineer (Engineer) and in accordance with sub-section 4.2 of the General Conditions.

The Contractor shall clearly identify and inform the Engineer in writing of any deviations from the contract documents at the time of submission and shall obtain the Engineer's written approval to the specified deviation prior to proceeding with any work.

- N. WAGES AND HOURS: In accordance with sub-sections 7.3 to 7.9 of the General Conditions relative to hours of labor, minimum wages and overtime pay, the current minimum wage rates promulgated by the Department of Labor and Industrial Relations (DLIR) shall be paid to the various classes of laborers and mechanics engaged in the performance of this contract on the job site. The minimum wages shall be increased during the performance of the contract in an amount equal to the increase in the prevailing wages for those kinds of work as periodically determined by the DLIR.

The Department of Land and Natural Resources will not recognize any claim for additional compensation because of the payment by the Contractor of any wage rate in excess of the said minimum wage rates. The possibility of wage increase is one of the elements to be considered by the Contractor in determining his bid, and will not, under any circumstances, be considered as the basis of a claim against the Department under this Contract.

No work shall be done on Saturdays, Sundays, legal State holidays, and/or in excess of eight (8) hours each day without the written consent of the Engineer. Should permission be granted to work at such times, the Contractor shall pay for all inspection administrative costs thereof. No work shall be done at night unless authorized by the Engineer.

- O. PERMITS: The State will process permit applications whenever possible, and the Contractor shall procure the pre-processed permits and pay the required fees. If permit applications are not processed by the State, the Contractor shall process the permit applications, permits and licenses, and pay all charges and fees. In all cases, the Contractor shall give all notices necessary and incident to the due and lawful prosecution of the work.
- P. PROPERTY DAMAGE: It shall be the responsibility of the contractor to respect State property and to prevent damage to existing improvements. The Contractor will be responsible for damages resulting from construction operations. Immediately upon discovery, the Contractor shall repair such damage to the satisfaction of the Engineer.

All trees and shrubbery outside the excavation, embankment or construction limits shall be fully protected from injury.

- Q. TIME: The time of completion is specified in the Proposal. It is the Board's intention to insist the Contractor diligently prosecute the work to completion within the specified time.

Prospective bidders are reminded that the State has the option to proceed with or abandon a project depending on whether the project can be completed for occupancy in the specified time.

It is the bidder's responsibility to check the availability of all materials before bidding. The bidder shall select sub-contractors and suppliers who can warrant availability and delivery of all specified or qualified materials to assure project completion within the specified time.

The successful bidder must assume all risks for completing the project by the specified date. There shall be no extension of time for any reason except for delays caused by acts of God, labor disputes involving unions, or actions of the State. If for any reason the project falls behind schedule, the Contractor shall at its own cost, take necessary remedial measures to get the project back on schedule, i.e., working overtime, air freighting all materials, etc. In addition, if the Contractor fails to fully complete the project by the completion date, Contractor will be required to make the facility usable at its own cost.

- R. BIDDER'S RESPONSIBILITY TO PROVIDE PROPER SUPERINTENDENCE: The successful low bidder shall designate in writing to the Engineer the name of its authorized superintendent (Superintendent), who will be present at the job site whenever any work is in progress. The Superintendent shall be responsible for all work, receiving and implementing instructions from the Engineer in a timely manner. The cost for superintendence shall be considered incidental to the project.

If the Superintendent is not present at the site of work, the Engineer shall have the right to suspend the work as described under sub-section 5.5 c. and 7.20 - Suspension of Work of the General Conditions.

- S. LIQUIDATED DAMAGES: Liquidated damages in the amount specified in the Proposal will be assessed for each and every calendar day from and after the expiration of the time period stated in the Contract for the completion of the project.

- T. HIRING OF LOCAL LABOR: The Contractor shall hire local labor whenever practicable.
- U. WATER AND ELECTRICITY: The Contractor shall make all necessary arrangements and pay all expenses for water and electricity used in the construction of this project.
- V. PUBLIC CONVENIENCE AND SAFETY: The Contractor shall conduct construction operations with due regard to the convenience and safety of the public at all times. No materials or equipment shall be stored where it will interfere with the safe passage of public traffic. The Contractor shall provide, install, and maintain in satisfactory condition, all necessary signs, flares and other protective facilities and shall take all necessary precautions for the protection of the work and the convenience and safety of the public. The Engineer shall have the right to suspend the performance of the work in accordance with sub-section 7.20 - Suspension of Work of the General Conditions.
- W. WORK TO BE DONE WITHOUT DIRECT PAYMENT: Whenever the contract that the Contractor is to perform work or furnish materials of any kind for which no price is fixed in the contract, it shall be understood that the Contractor shall perform such work or furnish said materials without extra charge or allowance or direct payment of any sort. The cost of performing such work or furnishing said material is to be included by the Contractor in a unit price for the appropriate item unless it is expressly specified that such work or material is to be paid for as extra work.
- X. AS-BUILT DRAWINGS: As-built drawings, the intent of which is to record the actual in-place construction so that any future renovations or tie-ins can be anticipated accurately, shall be required. All authorizations given by the Engineer to deviate from the plans shall be drawn on the job site plans. All deviations from alignments, elevations and dimensions which are stipulated on the plans shall be recorded on the as-built drawings. Final as-built drawings shall be submitted to the Engineer by the Contractor at the end of the project in both hard copy and electronic copy in Adobe PDF format on CD ROM.
- Y. ASBESTOS CONTAINING MATERIALS: The use of asbestos containing materials or equipment is prohibited. The Contractor shall insure that all materials and equipment incorporated in the project are asbestos-free
- Z. WORKER SAFETY: The Contractor shall provide, install and maintain in satisfactory condition all necessary protective facilities and shall take all necessary precautions for the protection and safety of its workers in accordance with the Occupational Safety and Health Standards for the State of Hawaii. The Engineer shall have the right to suspend the performance of the work in accordance with sub-section 7.20 - Suspension of Work of the General Conditions.
- AA. TOILET FACILITIES: All toilet facilities constructed at the project site shall be in accordance with the Public Health Regulations of the State Department of Health (DOH). All necessary precautions shall be observed at the project site. The use of sanitary facilities shall be strictly enforced and workers violating these provisions shall be promptly discharged.
- BB. SIGNS: Whenever the project involves closing or obstructing any public thoroughfare, the Contractor shall provide traffic signs conforming to the applicable provisions of the current edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways",

published by the Federal Highway Administration as directed by the Engineer for the purpose of diverting or warning traffic prior to the construction area. All traffic signs shall bear proper wording stating thereon the necessary information as to diverting or warning traffic.

The Contractor shall also provide a project sign, size 4'-0" x 7'-0" to be placed as directed by the Engineer. The sign shall be constructed in accordance with Section 01581 - Project Sign of these specifications and approved by the Engineer. All wording, type and size of lettering and color selection shall be as specified in these specifications or as approved by the Engineer.

All signs shall be kept neat and clean, and properly erected at all times.

- CC. FIELD OFFICE AREA FOR DEPARTMENT: The Contractor shall provide a housed working area of at least 100 square feet adjacent to the Contractor's office for the Department's use. This area will be used by the Engineer to perform tests and to store equipment. As a minimum, the field office shall include the following: standard sized office desk and chair, lighting, ventilation, window-type air conditioning rated at 5,000 BTU, door and window with locking hardware, electrical outlets, and working communications facilities (a cellular telephone is acceptable). The Department will pay for all long distance toll charges made by the Engineer.
- DD. QUANTITIES: All bids will be compared on the basis of quantities of work to be done as shown in the Proposal; the quantities shown in the Unit Price items are estimated, being given as a basis for comparison of bids. The Board reserves the right to increase or decrease the quantities given under the items or delete items entirely as may be required during the progress of the work.
- EE. OTHER HEALTH MEASURES: Forms of work site exposure or conditions which may be detrimental to the health or welfare of workers or of the general public shall be eliminated or reduced to safe levels as required by the DOH codes, standards, and regulations. Suitable first aid kits and a person qualified to render first aid, as specified in the DOH regulations, shall be provided at all times when work is scheduled.
- FF. HAWAII BUSINESS OR COMPLIANT NON-HAWAII BUSINESS REQUIREMENT: 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, as stipulated in §3-122-112 HAR.
- GG. COMPLIANCE WITH §3-122-112 HAR:  
As a condition for award of the contract and as proof of compliance with the requirements of 103D-310(c) HRS, the apparent low bidder shall furnish the required documents to the Department. If the valid required certificates are not submitted on a timely basis for award of a contract, a bidder otherwise responsive and responsible may not receive the award. Bidder is responsible to apply for and submit the following documents to the Department.

- A. TAX CLEARANCE REQUIREMENTS (HRS Chapter 237): Bidder shall obtain a tax clearance certificate from the Hawaii State Department of Taxation (DOTAX) and the Internal Revenue Service (IRS). The certificate is valid for six months from the most recently approved stamp date on the certificate; the certificate must be valid on the date received by the Department.
  
- B. Department of Labor (DLIR) “**Certificate of Compliance**”. (HRS Chapter 383 - Unemployment Insurance, Chapter 386 - Workers’ Compensation, Chapter 392 - Temporary Disability Insurance, and 393 – Prepaid Health Care): Bidder shall obtain a certificate of compliance from the Hawaii State Department of Labor and Industrial relations (DLIR). The certificate is valid for six months from the date of issue; certificates must be valid on the date received by the Department.
  
- C. Department of Commerce and Consumer Affairs (DCCA), Business Registration Division (BREG) “**Certificate of Good Standing**”. Bidder shall obtain a certificate of good standing issued by the Department of Commerce and Consumer Affairs (DCCA), Business Registration Division (BREG). The certificate of good standing is valid for six months from the date of issue; certificates must be valid on the date received by the Department.

Alternately, instead of separately applying for these certificates at the various state agencies, bidder may choose to use the Hawaii Compliance Express (HCE), which allows businesses to register online through a simple wizard interface at <http://vendors.ehawaii.gov> to acquire a “Certificate of Vendor Compliance” indicating the bidder’s status is compliant with the requirements of §103D-310(c), HRS, and shall be accepted for contracting and final payment purposes. Bidders that elect to use the new HCE services will be required to pay an annual fee of \$15.00 to the Hawaii Information Consortium, LLC (HIC). Bidders choosing not to participate in the HCE program will be required to provide the paper certificates as instructed in the previous paragraphs.

PROPOSAL

FOR

DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION  
State of Hawaii

JOB NO. D00CO61A  
MAKIKI VALLEY TRAIL  
PEDESTRIAN BRIDGE REPLACEMENT  
HONOLULU, OAHU, HAWAII

\_\_\_\_\_, 2015

Chief Engineer  
Engineering Division  
Department of Land and Natural Resources  
State of Hawaii  
Honolulu, Hawaii

Dear Sir:

The undersigned, having carefully examined the local conditions and all available records and information covering conditions which may affect the cost of the work to be performed, and having carefully examined the Plans and Specifications, and other contract documents, hereby proposes to furnish and pay for all materials, tools, equipment, labor and other incidental work necessary to reconstruct the pedestrian bridge and related improvements at Makiki Valley Trail, as required or called for in this Proposal, all according to the true intent and meaning of the Notice to Bidders, Information and Instructions to Bidders, Proposal, Detailed Specifications, Interim General Conditions, Plans, and any and all addenda for:

JOB NO. D00CO61A  
MAKIKI VALLEY TRAIL  
PEDESTRIAN BRIDGE REPLACEMENT  
HONOLULU, OAHU, HAWAII

on file in the office of the Engineering Division for the TOTAL BASE BID (Items 1 to 5) of:

\_\_\_\_\_  
Dollars (\$ \_\_\_\_\_)

and will fully complete all work under this contract within 90 consecutive calendar days from the date of written notice to proceed, including date of said order, said total sum being itemized on the following pages.

## PROPOSAL

Item No.	Quantity	Unit	Description	Unit Price	Total
<b>BASE BID</b>					
1.		LS	Demolition and Removal. Work includes, but is not limited to, demolition, hauling, and proper disposal of items indicated or required to be removed to accommodate new improvements.		\$ _____
2.		LS	Construct new pedestrian bridge, in place complete. Work includes, but not limited to, Best Management Practices; clearing and grubbing; grading and earthwork; construction of cast-in-place concrete abutments; construction of single span pedestrian bridge with plastic lumber decking and facing, and redwood railings; and any other miscellaneous work and materials required to make the new bridge complete and ready for public use.		\$ _____
3.		LS	Project Sign		\$ _____
4.		Allowance	Field Office		\$ <u>8,000.00</u>
<b>Subtotal Base Bid (Items 1 to 4)</b>					<b>\$ _____</b>
5.		LS	Mobilization and Demobilization. (Not to Exceed 10% of the Total Sum Bid)		\$ _____
<b>Total Base Bid (Items 1 to 5)</b>					<b>\$ _____</b>

HAWAII PRODUCTS PREFERENCE AND/OR USE OF HAWAII PRODUCTS

In accordance with Act 175, SLH 2009, the Hawaii products preference is applicable to this solicitation. Bidders offering a Hawaii product (“HP”) shall identify the HP in the table below.

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 the completed form no later than the deadline specified in the procurement notice and solicitation. The responsibility for certification and qualification shall rest upon the person requesting the preference. One form shall be completed and submitted for each product. Form SPO-38 is available at <http://hawaii.gov/spo/goods-services-construction/preferences-103d-pt-x/hi-products/hawaii-product-preferences>.

For the purpose of selecting the low bid when a solicitation contains both HP and non-HP, the price offered for a HP item shall be decreased by subtracting 10% for the class I or 15% for the class II HP item(s) offered. 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.

In the event of any change that materially alters the bidder’s ability to supply the Hawaii product(s), the bidder shall immediately notify the procurement officer in writing and the parties shall enter into discussions for the purpose of revising the contract or terminating the contract for convenience.

Item No.	Pre-Approved Hawaii Product Description & Manufacturer	Class (I or II)	Quantity	Unit Measure	Unit Price	Total Price
1.	<i>[Product Description, Manufacturer Name]</i>					
2.						
3.						
4.						

RECYCLED PRODUCTS PREFERENCE

This project allows a 10% price preference for recycled products in accordance with HRS 103D-1005. Please indicate your recycled or non-recycled product by indicating its cost FOB jobsite unloaded in the schedule below, including applicable General Excise & Use Taxes.

<u>DESCRIPTION</u>	<u>RECYCLED PRODUCT COST</u>	<u>NONRECYCLED PRODUCT COST</u>
_____	\$ _____	\$ _____
_____	\$ _____	\$ _____
_____	\$ _____	\$ _____
_____	\$ _____	\$ _____

The bidder requesting a recycled product preference shall also complete and submit the form "CERTIFICATION OF RECYCLED CONTENT" as shown in the Interim General Conditions and provide all supporting information with this proposal. Additional information may be requested to qualify a product.

The following definitions are applicable to the CERTIFICATION OF RECYCLED CONTENT form:

"Post-consumer recovered material" means any product used by a consumer, including a business that purchases the material, that has served its intended end use, and that has been separated or diverted from the solid waste stream for the purpose of use, reuse, or recycling.

"Product" includes materials, manufactures, supplies, merchandise, goods, wares, and foodstuffs.

"Recovered material" means waste material and by-products that have been separated, diverted, or removed from the solid waste stream after a manufacturing process for the purpose of use, reuse, or recycling. Recovered material does not include those materials and by-products that are generated and normally reused on-site or within original manufacturing processes (such as mill broke, in the case of paper products).

"Recycled content" means the percentage of a product composed of recovered material, or post-consumer recovered material, or both.

"Recycled product" means a product containing recovered material, or post-consumer recovered material, or both.

The bidder agrees that preference for recycled products shall be taken into consideration to determine the low bidder in accordance with said Section and the rules promulgated, however, the award of contract will be in the amount of the bid offered exclusive any preference.

APPRENTICESHIP AGREEMENT PREFERENCE

Apprenticeship agreement preference is not applicable to this solicitation.

CONTRIBUTIONS BY STATE AND COUNTY CONTRACTORS PROHIBITED

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.

### CONDITION OF AWARD

It is understood that the award of the contract will be made on the basis of the lowest responsible Total Base Bid (Items 1 to 5) selected by the Board of Land and Natural Resources. Write the total of bid items 1 to 5 on page P-1.

It is understood and agreed that the Board of Land and Natural Resources reserves the right to reject any and/or all bids and waive any defects when, in the Board's opinion, such rejection or waiver will be for the best interest of the State of Hawaii.

In the event all bids exceed available funds certified by the appropriate fiscal officer, the head of the purchasing agency responsible for the procurement in question is authorized in situations where time or economic considerations preclude resolicitation of work of a reduced scope to negotiate an adjustment of the bid price, including changes in the bid requirements, with the low responsible and responsive bidder, in order to bring the bid within the amount of available funds. It is understood and agreed upon that the head of the purchasing agency may delete a portion or all of any item(s) in the proposal at the stated unit or lump sum price as necessary to stay within the available funding. The bidder is responsible to make an earnest effort to represent the actual cost of each item, including all materials, labor, equipment, overhead and profit in their bid proposal to preclude claims of anticipated profit or loss of profit because of an unbalanced bid proposal.

It is also understood that if a mutually agreeable cost for the reduced scope of work necessitated by a lack of available funds cannot be agreed upon between the bidder and the head of the purchasing agency within 14 calendar days after the bid opening, then the bid may be rejected in the best interest of the purchasing agency, and the head of the purchasing agency may negotiate in progressive order (lowest to highest) with the next lowest responsible and responsive bidder.

It is also understood and agreed that the award of the contract shall be conditioned upon funds being made available for this project and further upon the right of the Board of Land and Natural Resources to hold all bids received for a period of sixty (60) days from the date of the opening thereof, unless otherwise required by law, during which time no bid may be withdrawn.

It is also understood that Notice to Proceed may be delayed up to one (1) year after the bid opening date, and that no additional compensation will be provided for any claim for escalation or delay for issuance of Notice to Proceed on or before that date.

It is also understood and agreed that the quantities given herewith are approximate only and are subject to increase or decrease, and that the undersigned will perform all quantities of work as either increased or decreased, in accordance with the provisions of the Contract Specifications.

It is also understood and agreed that the estimated quantities shown for the items for which a UNIT PRICE is asked in this Proposal are only for the purpose of comparing on a uniform basis, bids offered for the work under this contract, and the undersigned agrees that he is satisfied with and will at no time, dispute said estimated quantities as a means of claims for anticipated profit or loss of profit, because of a difference between the quantities of the various classes of work done or the materials and equipment installed, and the said estimated quantities. On UNIT PRICE bids, payment will be made only for the actual number of units incorporated into the finished project at the contract UNIT PRICE.

After the proposals are opened and read, the figures will be extended and/or totaled in accordance with the bid prices of the acceptable proposals and the totals will be compared. In the comparison of bids, words written in the proposal shall govern over figures and unit prices will govern over totals. Until the award of

the contract, however, the right will be reserved to reject any and all proposals and to waive any defects or technicalities as may be deemed best for the interest of the State.

It is also understood and agreed that liquidated damages in the amount of One Hundred Dollars (\$100.00) for each and every calendar day in excess thereof prior to completion of the contract shall be withheld from payments due to the Contractor.

It is also understood and agreed that if this bid is accepted, the successful bidder must enter into and execute a contract with the Board of Land and Natural Resources and furnish a Performance and Payment Bond, as required by law. These bonds shall conform to provisions of Section 103D-324 and 325, Hawaii Revised Statutes and any law applicable hereto.

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

It is understood that by submitting this proposal, the undersigned is declaring that his firm has not been assisted or represented on this matter by an individual who has, in a State capacity, been involved in the subject matter of this contract in the past two years.

It is understood that by submitting this proposal in accordance with HAR 3-122-192, the undersigned is declaring that the price submitted is independently arrived without collusion.

It is also understood that by submitting this proposal, a Certification for Safety and Health Programs for bids in excess of \$100,000 (in accordance with HRS 396-18), the undersigned certifies that his organization will have a written safety and health plan for this project that will be available and implemented by the Notice to Proceed date of this project. Details of the requirements of this plan may be obtained from the Department of Labor and Industrial Relations, Occupational, Safety and Health Division (HIOSH).

It is further understood and agreed that the successful bidder shall comply with paragraph 3.1.a "SUBCONTRACTING" of the General Provisions which requires that the contractor shall perform with his own organization and with the assistance of workmen under his immediate superintendence, work of a value not less than twenty percent (20%) of the value of all work embraced in the Contract, except that certain contract items of work, if specifically referred to in the special provisions, will be exempted from said twenty percent requirement.

Compliance with §103-310 HRS. As a condition of award all bidders shall comply with all laws governing entities doing business in the State, including Chapter 237 HRS (general excise tax); Chapter 383 HRS (employment security – unemployment insurance); Chapter 386 HRS (workers compensation); Chapter 392 HRS (temporary disability insurance); and Chapter 393 HRS (pre-paid health care), and shall produce all documents to the State (DLNR, Engineering Division) required to demonstrate compliance with these subsections. Any bidder making a false affirmation or certification under this subsection shall be suspended and may be debarred from further offerings or awards pursuant to §103D-702 HRS.

**RECEIPT OF ADDENDA**

The bidder also acknowledges receipt of any and all addenda issued by the Engineering Division, by recording the date of receipt of the respective addenda in the space provided below:

<u>Addendum</u>	<u>Date Received</u>	<u>Addendum</u>	<u>Date Received</u>
No. 1	_____	No. 5	_____
No. 2	_____	No. 6	_____
No. 3	_____	No. 7	_____
No. 4	_____	No. 8	_____

It is understood that failure to receive any such addendum shall not relieve the Contractor from any obligation under this Proposal as submitted.

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

JOINT CONTRACTORS OR SUBCONTRACTORS  
TO BE ENGAGED ON THIS PROJECT

The Bidder agrees that the following is a complete listing of all joint contractors or subcontractors covered under Chapter 444, Hawaii Revised Statutes (HRS), who will be engaged by the Bidder on this project to perform the required work indicated pursuant to Section 103D-302, HRS. It is the sole responsibility of the contractor to review the requirements of this Project and determine the appropriate licenses that are required to complete the Project. The Bidder certifies that the completed listing of joint contractors or subcontractors fulfills the requirements for the project and the Bidder, together with the listed subcontractors or joint contractors have all the specialty contractor's licenses to complete the work, except as provided for in HRS §103D-302(b). Failure of the Bidder to comply with this requirement may be just cause for rejection of the bid.

“A” General Engineering Contractors and “B” General Building Contractors are reminded that due to the Hawaii Supreme Court’s January 28, 2002 decision in Okada Trucking Co., Ltd. v. Board of Water Supply, et al., 97 Haw. 450 (2002), they are prohibited from undertaking any work, solely or as part of a larger project, which would require the general contractor to act as a specialty contractor in any area in which the general contractor has no license. Although the “A” and “B” contractor may still bid on and act as the “prime” contractor on an “A” or “B” project (See, HRS § 444-7 for the definitions of an “A” 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 (*An “A” or “B” contractor obtains “C” specialty contractor’s licenses either on its own, or automatically under HAR §16-77-32*). The remaining work must be performed by the appropriately licensed entities.

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.

General Building “B” Contractors automatically have these “C” specialty contractor licenses: C-5, C-6, C-10, C-12, C-24, C-25, C-31a, C-32a, C-42a and C-42b.

In completing the Joint Contractors or Subcontractors List, describe the specialty contractor’s nature and scope of work to be performed for this project and provide the complete firm name of the joint contractor or subcontractor in the respective columns. If the Bidder is a general contractor providing the work of a required specialty contractor, whose license is not automatically held pursuant to HAR 16-77-32, fill in the Bidder’s (general contractor’s) name and nature and scope of work to be performed on this project.

List only one joint contractor or subcontractor per required specialty contractor’s classification, unless within the same specialty, the work of each joint contractor or subcontractor can be described so that there is no overlap in work descriptions.

If a contractor’s license is required by law for the performance of the work which is called for in this bid, the bidder and all subcontractors must have the required license before the submission of the bidder’s proposal in the case of a non-federal aid project, and for federal-aid projects, the bidder must have the required license prior to the award of the project and all subcontractors prior to the start of the subcontracted work.



Enclosed herewith is a:

- 1. Surety Bond (\*1) )
- 2. Legal Tender (\*2) )
- 3. Cashier's Check (\*3) )
- 4. Certificate of Deposit (\*3) ) in the
- 5. Certified Check (\*3) ) amount
- 6. Official Check (\*3) ) of
- 7. Share Certificate (\*3) )
- 8. Teller's Check (\*3) )
- 9. Treasurer's Check (\*3) )

(Cross Out Those Not Applicable)

\_\_\_\_\_ Dollars (\$ \_\_\_\_\_)

as required by law.

Respectfully submitted,

\_\_\_\_\_  
Name of Company, Joint Venture  
or Partnership

\_\_\_\_\_  
Contractor's License No.

By \_\_\_\_\_  
Signature (\*4)

Title \_\_\_\_\_

Print Name \_\_\_\_\_

Date \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_  
Telephone No. \_\_\_\_\_

E-Mail Address \_\_\_\_\_

NOTES:

1. Surety bond underwritten by a company licensed to issue bonds in this State;
2. Legal tender; or
3. A certificate of deposit; share certificate; or cashier's, treasurer's, teller's, or official check drawn by, or a certified check accepted by, 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 security or bond amount totals over \$100,000, more than one instrument not exceeding \$100,000 each and issued by different financial institutions shall be accepted.
4. Please attach to this page evidence of the authority of this officer to submit bids on behalf of the Company and also the names and residence addresses of all officers of the Company.
5. Fill in all blank spaces with information asked for or bid may be invalidated. PROPOSAL MUST BE INTACT, MISSING PAGES MAY INVALIDATE YOUR BID.

**End of Proposal**

## SPECIAL PROVISIONS

Amend INTERIM GENERAL CONDITIONS, dated October 1994, as follows:

### Section 2 – Proposal Requirements and Conditions

#### 1. AMEND Section 2.1 Qualification of Bidder with the following:

Written Notice of Intent to Bid or Offer: A written Notice of Intent to Bid is not required for the Solicitation.

Standard Qualification Questionnaire: Bidders may be required to complete a standard qualifications questionnaire. When requested, the information shall be furnished within two working days or longer at the discretion of the Engineer. Failure to furnish the requested information within the time allowed may be grounds for a determination of non-responsibility, in accordance with HRS Section 103D-310 and HAR Section 3-122-108.

Hawaii Business or Compliant Non-Hawaii Business Requirement: Bidders 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, as stipulated in §3-122-112 HAR. A certified letter is not required prior to bid opening.

Compliance with §3-122-112 HAR: As a condition for award of the contract and as proof of compliance with the requirements of 103D-310(c) HRS, the apparent low bidder shall furnish the required documents to the Department. If the valid required certificates are not submitted on a timely basis for award of a contract, a bidder otherwise responsive and responsible may not receive the award. Bidder is responsible to apply for and submit the following documents to the Department.

- A. Tax Clearance (HRS Chapter 237): Bidder shall obtain a tax clearance certificate from the Hawaii State Department of Taxation (DOTAX) and the Internal Revenue Service (IRS). The certificate is valid for six months from the most recently approved stamp date on the certificate; the certificate must be valid on the date received by the Department.
- B. Department of Labor (DLIR) “Certificate of Compliance”. (HRS Chapter 383 - Unemployment Insurance, Chapter 386 - Workers’ Compensation, Chapter 392 - Temporary Disability Insurance, and 393 – Prepaid Health Care): Bidder shall obtain a certificate of compliance from the Hawaii State Department of Labor and Industrial relations (DLIR). The certificate is valid for six months from the date of issue; certificates must be valid on the date received by the Department.
- C. Department of Commerce and Consumer Affairs (DCCA), Business Registration Division (BREG) “Certificate of Good Standing”. Bidder shall obtain a certificate of good standing issued by the Department of Commerce and Consumer Affairs (DCCA), Business Registration Division (BREG). The certificate of good standing is valid for six months from the date of issue; certificates must be valid on the date received by the Department.

**Hawaii Compliance Express.** Alternately, instead of separately applying for these certificates at the various state agencies, bidder may choose to use the Hawaii Compliance Express (HCE), which allows businesses to register online through a simple wizard interface at <http://vendors.ehawaii.gov> to acquire a “Certificate of Vendor compliance” indicating that bidder’s status is compliant with requirements of §103D-310(c), HRS, shall be accepted for contracting and final payment purposes.

Bidders that elect to use the new HCE services will be required to pay an annual fee of \$15.00 to the

Hawaii Information Consortium, LLC (HIC). Bidders choosing not to participate in the HCE program will be required to provide the paper certificates as instructed in the previous paragraphs.

2. **ADD** Section 2.4a, Pre-Bid Conferences

Required Pre-bid Conferences: For construction and design-build projects with an estimated value of \$500,000 or more and solicited under the competitive sealed bid method (103D-302 HRS); and for construction and design-build projects with an estimated value of \$100,000 or more and solicited under the competitive sealed proposal method (103D-303 HRS); a pre-bid conference is required.

Other Pre-Bid Conferences: The Department may require a pre-bid conference for construction or design-build projects that are below the dollar threshold listed in above or when projects have special or unusual requirements.

Other Conditions: The Department may require the prospective Bidders to make a physical inspection of the project site and make attendance at the pre-bid conference a condition for submitting an offer.

Nothing stated at the pre-bid conference shall change the solicitation unless a change is made by written addendum.

3. **DELETE** Section 2.5, Addenda and Interpretations, in its entirety and replace with the following:

“Discrepancies, omissions, or doubts as to the meaning of drawings and specifications should be communicated using the question and answer section on the HIEPRO solicitation for interpretation and must be received in the time frame set in the HIEPRO solicitation. Any interpretation, if made and any supplemental instructions will be in the form of written addenda to the plans and specifications and made available prior to the offer due date. It shall be the prospective bidder’s sole responsibility to verify and obtain any said addenda. Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his bid as submitted. All addenda so issued shall become part of the contract documents.”

**Section 3 – Award and Execution of Contract**

1. **AMEND** Section 3.3, Award of Contract, by deleting “sixty (60)” and replacing with “ninety (90)” in the first paragraph.

2. **AMEND** Section 3.3, Award of Contract, by adding the following after the first paragraph:

“If the contract is not awarded within the ninety (90) days, the Department may request the successful Bidder to extend the time for the acceptance of its bid. The Bidder may reject such a request without penalty; and in such case, the Department may at its sole discretion make a similar offer to the next lowest responsive and responsible bidder and so on until a bid is duly accepted or until the Department elects to stop making such requests.”

3. **AMEND** Section 3.9, Notice to Proceed, by deleting “180 days” and replacing with “one (1) year” in the last paragraph.

4. **ADD** Section 3.10, Protests:

**“3.10 PROTESTS—**Pursuant to Section 103D-701, Hawaii Revised Statutes, an actual or prospective offeror who is aggrieved in connection with the solicitation or award may submit a protest. Any protest

shall be submitting in writing to the Chairperson, Department of Land and Natural Resources, 1151 Punchbowl Street, Honolulu, Hawaii 96813, or designee as specified in the solicitation.

A protest shall be submitted in writing within five (5) working days after the aggrieved person knows or should have known the facts giving rise thereto; provided that a protest based upon the content of the solicitation shall be submitted in writing prior to the date set for receipt of offers. Further provided that a protest of an award or proposed award shall be submitted within five (5) working days after the posting of the award of the contract.

The notice of award, if any, resulting from this solicitation shall be posted on the Procurement System on the SPO website: <http://www.hawaii.gov/spo2/source/>.”

### **Section 5 – Control of Work**

**AMEND** Section 5.8 Value Engineering Incentive by deleting “\$100,000” and replacing with “\$250,000” in the first paragraph.

### **Section 6 – Substitution of Materials and Equipment**

**ADD** the following to Section 6.3 Sub-paragraph b:

4. If the substitution meets all the requirements of the specifications and plans.

### **Section 7 – Prosecution and Progress**

1. **DELETE** Section 7.2d in its entirety and replace with the following:

“d. Insurance Requirements

#### 1. Obligation of Contractor

The Contractor shall not commence any work until it obtains, at its own expense, all required insurance. Such insurance must have the approval of the Department as to limit, form and amount and must be maintained with a company authorized by law to issue such insurance in the State of Hawaii.

All insurance described herein will be maintained by the Contractor for the full period of the contract and in no event will be terminated or otherwise allowed to lapse prior to written certification of final acceptance of the work by the Department.

Certificate(s) of Insurance acceptable to the Department shall be filed with the Engineer prior to commencement of the work. These certificates shall contain a provision that coverages afforded under the policies will not be canceled or changed until at least thirty days written notice has been given to the Engineer by registered mail. The insurance policies shall name the State of Hawaii, its officers and employees as an additional insured and such coverage shall be noted on the Certificate. Should any policy be canceled before final acceptance of the work by the Department, and the Contractor fails to immediately procure replacement insurance as specified, the Department, 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.

Nothing contained in these insurance requirements is to be construed as limiting the extent of Contractor's responsibility for payment of damages resulting from its operations under this contract, including the Contractor's obligation to pay liquidated damages, nor shall it affect the Contractor's separate and independent duty to defend, indemnify and hold the Department harmless pursuant to other provisions of this contract. In no instance will the Department's exercise of an option to occupy and use completed portions of the work relieve the Contractor of its obligation to maintain the required insurance until the date of final acceptance of the work.

All insurance described herein shall cover the insured for all work to be performed under the contract, all work performed incidental thereto or directly or indirectly connected therewith, including traffic detour work or other work performed outside the work area, and all change order work.

The Contractor shall, from time to time, furnish the Engineer, when requested, satisfactory proof of coverage of each type of insurance required or a copy of the actual policies covering the work. Failure to comply with the Engineer's request may result in suspension of the work, and shall be sufficient grounds to withhold future payments due the Contractor and to terminate the contract for Contractor's default.

## 2. Types of Insurance

The Contractor shall purchase and maintain insurance described below which shall provide coverage against claims arising out of the Contractor's operations under the contract, whether such operations be by the Contractor itself or by the subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable.

- (a) Worker's Compensation. The Contractor and all subcontractors shall obtain full worker's compensation insurance coverage for all persons whom they employ or may employ in carrying out the work under this contract. This insurance shall be in strict conformity with the requirements of the most current and applicable State of Hawaii Worker's Compensation Insurance laws in effect on the date of the execution of this contract and as modified during the duration of the contract.
- (b) Commercial General Liability Insurance and Automobile Insurance. Contractor's commercial general liability insurance and automobile liability insurance shall both be obtained in a combined, single limit of not less than \$1,000,000 per occurrence that shall include coverage for bodily injury, sickness, disease or death of any person, arising directly or indirectly out of, or in connection with, the performance of work under this contract.

The Contractor's property damage liability insurance shall provide for a single combined limit of not less than \$1,000,000 for all damages arising out of injury to or destruction of property of others including the Department's, arising directly or indirectly out of or in connection with the performance of the work under this contract including explosion or collapse.

The Contractor shall either:

- i. Require each of its subcontractors to procure and to maintain during the life of its subcontract, subcontractors' comprehensive general liability, automobile liability

and property damage liability insurance of the type and in the same amounts specified herein; or

- ii. Insure the activities of its subcontractors in its own policy.

The Contractor will be permitted, in cooperation with insurers, to maintain a self insured retention for up to 25% of the per occurrence combined single limits of the commercial general liability and the automobile liability policies. The existence of the self insured retention must be noted on the certificate of insurance coverage submitted to the Department or else it will be understood that the insurer is providing first dollar coverage for all claims. For all claims within the self-insured retention amount, the rights, duties and obligations between the Contractor and the Department shall be identical to that between a liability insurer and the Department, as an additional insured, as if there was no self-insured retention.

- (c) **Builder's Risk Insurance.** Unless included in the Specifications of this project, the Contractor shall not be required to provide builder's risk insurance. If required as noted in the Specifications, builder's risk insurance shall be provided during the progress of work and until final acceptance by the Department upon completion of the contract. It shall be "All Risk" (including but not limited to earthquake, windstorm and flood damage) completed value insurance coverage on all completed work and work in progress to the full replacement value thereof. Such insurance shall include the Department as additional name insured. The Contractor shall submit to the Engineer for its approval all items deemed to be uninsurable. The policy may provide for a deductible in an amount of up to 25% of the amount insured by the policy. With respect to all losses up to any deductible amount, the relationship between the Contractor and the Department shall be that of insurer and additional insured as if no deductible existed".

**2. DELETE** Section 7.16 in its entirety and replace with the following:

"RESPONSIBILITY FOR DAMAGE CLAIMS; INDEMNITY – The Contractor shall indemnify the State and the Department against all loss of or damage to the State's or the Department's existing property and facilities arising out of any act or omission committed in the performance of the work by the Contractor, any subcontractor or their employees and agents. Contractor shall defend, hold harmless and indemnify the Department and the State, their employees, officers and agents against all losses, claims, suits, liability and expense, including but not limited to attorneys' fees, arising out of injury to or death of persons (including employees of the State and the Department, the Contractor or any subcontractor) or damage to property resulting from or in connection with performance of the work and not caused solely by the negligence of the State or the Department, their agents, officers and employees. The State or the Department may participate in the defense of any claim or suit without relieving the Contractor of any obligation hereunder. The purchase of liability insurance shall not relieve the Contractor of the obligations described herein.

The Contractor agrees that it will not attempt to hold the State and its Departments and Agencies and their officers, representatives, employees or agents, liable or responsible for any losses or damages to third parties from the action of the elements, the nature of the work to be done under these specifications or from any unforeseen obstructions, acts of God, vandalism, fires or encumbrances which may be encountered in the prosecution of the work.

The Contractor shall pay all just claims for materials, supplies, tools, labor and other just claims against the Contractor or any subcontractor in connection with this contract and the surety bond will not be

released by final acceptance and payment by the Department unless all such claims are paid or released. The Department may, but is not obligated to, withhold or retain as much of the monies due or to become due the Contractor under this contract considered necessary by the Engineer to cover such just claims until satisfactory proof of payment or the establishment of a payment plan is presented.

The Contractor shall defend, indemnify and hold harmless the State and its Departments and Agencies and their officers, representatives, employees or agents from all suits, actions or claims of any character brought on account of any claims or amounts arising or recovered under the Worker's Compensation Laws or any other law, by-law, ordinance, order or decree.

### **Section 8 – Measurement and Payment**

1. **DELETE** Section 8.7a in its entirety and replace with the following:

- a. Tax Clearances from the State of Hawaii Department of Taxation and Internal Revenue Service, subject to section 103D-328, HRS, current within two months of issuance date indicating that all delinquent taxes levied or accrued under State Statutes against the contractor have been paid.

2. **ADD** Section 8.7d, Certificate of Compliance:

- d. A Certification from the Contractor affirming that the Contractor has, as applicable, remained in compliance with all laws as required by Section 103D-310, HRS, and Section 3-122-112, HAR. A contractor making a false affirmation shall be suspended and may be debarred pursuant to section 103D-702, HRS.

1. Certification of Compliance for Final Payment, State Procurement Office Form-22. Must be Signed Original.

3. **ADD** Section 8.7e, Hawaii Compliance Express:

- e. In lieu of submitting the tax clearances from Taxation and IRS, and SPO Form -22, the Contractor may choose to use the Hawaii Compliance Express as described on page SP-1 of this Special Provisions.

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## SECTION 01019

### GENERAL SPECIFICATIONS

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

Work shall consist of furnishing all labor, tools, materials and equipment necessary and required to construct in place complete all work as indicated on the drawings and as specified herein.

##### 1.2 GENERAL

- A. Construction Lines, Levels and Grades: The Contractor shall verify all lines, levels and elevations indicated on the drawings before any clearing, excavation or construction begins. Any discrepancy shall be immediately brought to the attention of the Engineer, and any change shall be made in accordance with the Engineer's instruction. The Contractor shall not be entitled to extra payment for failing to report the discrepancies before proceeding with any work whether within the area affected or not.
- B. Examination of Premises: The Contractor shall contact the Engineer and obtain permission before visiting the site.
- C. Notices: The Contractor shall notify the Engineer and give at least three (3) working days notice before starting any work.
- D. Disruption of Utility Services: All work related to the temporary disconnection of electrical and potable water systems shall be pre-arranged with the Engineer so that any disruption of such services will be kept to a minimum. In the event temporary power hook-up or water service is required, the Contractor shall provide the necessary services.
- E. Contractor's Operations
  - 1. The Contractor must employ, insofar as possible, such methods and means of carrying out the work so as to minimize interruption or interference to public use of the trails and trail heads. Where the Contractor's operations would result in interruption (trail closure), the Contractor shall notify the DOFAW and the Engineer at least two weeks prior to the proposed interruption so that the public can be properly notified. Trail closure shall be limited to ten (10) calendar days and be subject to approval of the Engineer. Contractor shall cooperate with the DOFAW in scheduling of the trail closure and post notices of the closure at the trail heads and intersections with adjoining trails. Contractor shall promptly remove such notices when trail is reopened.

2. The Contractor shall maintain safe passageway for the public to bypass the construction site and to utilize the trail head.

F. Parking and Vehicle Access

1. There is no vehicular access to the project site. It is recommended that the Contractor shuttle personnel, tools, equipment and materials from his base yard to the trail head at Round Top Drive. The Contractor will be allowed to park one vehicle at the trail head during normal work hours.
2. Areas that may be used by the Contractor shall be as designated by the Engineer. Any damages caused by the Contractor shall be restored to the satisfaction of the Engineer at no additional cost to the State.

G. Toilet Facilities: There are no toilet facilities at the project site or along the trails near the project site. The Contractor shall adhere to the following and the requirements of the State Department of Health (DOH):

1. Portable covered receptacles for fecal matter and urine, of the design and number specified by the DOH, shall be provided.
2. No employee will be allowed to deposit fecal matter or urine in any place except in these receptacles. Any infringement of this requirement shall result in immediate transfer or discharge of the offender or other disciplinary measures satisfactory to the Engineer.
3. All deposits in these receptacles shall be immediately covered with a chemical solution prescribed by the DOH. These receptacles, with their contents, shall be collected and removed for disposal at the close of each working day. The method of disposal must be satisfactory to the DOH to prevent contamination of any water supply, stream or other bodies of water.
4. The receptacles shall be thoroughly cleaned with water and the required chemical solution and then returned to the required places for service.

H. Protection of Property: The Contractor shall continually maintain adequate protection of all its work from damage and shall protect all property, including but not limited to buildings, equipment, furniture, signage, grounds, vegetation, material, and utility systems located at and adjoining the job site. The Contractor shall repair, replace or pay the expense of repair of damages resulting from its operations.

I. Use of Power Driven Equipment: The Contractor is cautioned to take all necessary safety precautions to protect personnel and the public whenever power driven equipment is used.

- J. Safety: The Contractor shall carefully read and strictly comply with the requirements of the Hawaii Occupational Safety and Health Law, Chapter 396, Hawaii Revised Statutes, as amended, is applicable and made a part of the Contract.
- K. Clean Up Premises: The Contractor shall clean up and remove from premises all debris accumulated from operations as necessary or as directed. See also Section 7.25 of the General Conditions.
- L. Responsibility
1. The State will hold the Contractor liable for all the acts of Subcontractors and shall deal only with the prime Contractor in matters pertaining to other trades employed on the job. The Contractor shall be responsible for coordinating the work of all trades on the job.
  2. Should the Contractor discover any discrepancy in the plans or specifications, the Contractor shall immediately notify the Engineer before proceeding any further with the work, otherwise, the Contractor will be held responsible for any cost involved in correction of work placed due to such discrepancy.
- M. Cooperation With Other Contractors: The State reserves the right at any time to contract for or otherwise perform other or additional work within the contract zone limits of this Contract. The Contractor of this project shall, to the extent ordered by the State, conduct its work so as not to interfere with or hinder the progress or completion of the work performed by other contractors.
- N. Division of the Work: The Divisions 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 all work specified within each Section.
- O. Drawings and Specifications
1. The Contractor shall not make alterations in the drawings and specifications. In the event the contractor discovers any errors or discrepancies, the Contractor shall immediately notify the Engineer in accordance with the General Conditions.
  2. 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.
  3. Specifications and drawings are prepared in abbreviated form 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.

P. Required Submittals

1. Refer to SECTION 01300 – SUBMITTALS. Required submittals as specified in the Technical Sections of these specifications include one or more of the following: Shop drawings; color samples; material samples; technical data; schedules of materials; schedules of operations; guarantees; operating and maintenance manuals; and as-built drawings.
2. The Contractor shall make a comprehensive list of the required submittals, by Specification Section, and submit this list to the Engineer within 15 days after notice to proceed.
3. As-Built Drawings:
  - a. As-built drawings, the intent of which is to record the actual in-place construction so that any future renovations or tie-ins can be anticipated accurately, shall be submitted.
  - b. All deviations from alignments, elevations and dimensions which are stipulated on the plans shall be recorded in red on the as-built drawings.
  - c. The following procedure shall be followed:
    - 1) Immediately after any changes are constructed in place, the Contractor shall record them on the field set of plans.
    - 2) Within two weeks after final inspection of the project, the Contractor shall transfer the changes marked on the field set of plans onto a clean copy of plans using a red pencil or ink. Any deletions shall be so noted and redrawn as necessary. The Contractor shall stamp or mark the plans "AS-BUILT", and also sign and date each drawing so marked.
    - 3) The Contractor shall submit the as-built drawings together with the marked-up field set of plans to the Engineer for review and approval.
    - 4) After the Engineer approves, the Contractor shall have the plans scanned full size to Adobe PDF format and submit the electronic file on CD ROM. The CD shall be labeled "AS-BUILTS" with Job No. and project name.

END OF SECTION

SECTION 01090

STANDARD REFERENCES

PART 1 - GENERAL

Wherever used in the project, the following abbreviations will have the meanings listed:

<u>Abbreviation</u>	<u>Company</u>
AA	Aluminum Association Incorporated 818 Connecticut Avenue, N.W. Washington, D.C. 20006
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, N.W., Suite 225 Washington, D.C. 20001
ACI	American Concrete Institute P.O. Box 19150 Detroit, MI
AEIC	Association of Edison Illuminating Companies 51 East 42nd Street New York, NY 10017
AFBMA	Anti-Friction Bearing Manufacturer's Association 60 East 42nd Street New York, NY 10017
AGA	American Gas Association 8501 East Pleasant Valley Road Cleveland, OH 44131
AGMA	American Gear Manufacturer's Association 1330 Massachusetts Avenue, N.W. Washington, D.C.
AISC	American Institute of Steel Construction 101 Park Avenue New York, NY 10017

<u>Abbreviation</u>	<u>Company</u>
AISI	American Iron and Steel Institute 1000 16th Street, N.W. Washington, D.C. 20036
AITC	American Institute of Timber Construction 333 West Hampden Avenue Englewood, CO 80110
AMCA	Air Moving and Conditioning Association, Inc. 30 West University Drive Arlington Heights, IL 60004
ANSI	American National Standards Institute, Inc. 1430 Broadway New York, NY 10018
APA	American Plywood Association 1119 A Street Tacoma, WA 98401
API	American Petroleum Institute 1801 K Street N.W. Washington, DC 20006
ARI	Air-Conditioning and Refrigeration Institute 1814 North Fort Myer Drive Arlington, VA 22209
ASCE	American Society of Civil Engineers 345 East 47th Street New York, NY 10017
ASCII	American Standard Code for Information Interchange United States of America Standards Institute 1430 Broadway New York, NY 10018
ASE Code	American Standard Safety Code for Elevators, Dumbwaiter and Escalators American National Standards Institute 1430 Broadway New York, NY 10018

<u>Abbreviation</u>	<u>Company</u>
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers United Engineering Center 345 East 47th Street New York, NY 10017
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, NY 10017
ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103
AWPA	American Wood Preservers Association 1625 Eye Street Washington, DC 20006
AWS	American Welding Society 2501 N.W. 7th Street Miami, FL 33125
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235
CBM	Certified Ballast Manufacturers 2120 Keith Building Cleveland, OH 44115
CMAA	Crane Manufacturers Association of America, Inc. (Formerly called: Overhead Electrical Crane Institute - OECI) 1326 Freeport Road Pittsburgh, PA 15238
CRSI	Concrete Reinforcing Steel Institute 180 North La Salle Street Chicago, IL 60601
CSA	Canadian Standards Association 178 Rexdale Boulevard Rexdale, Ontario, M9W 1R3, Canada
DEMA	Diesel Engine Manufacturer's Association

<u>Abbreviation</u>	<u>Company</u>
	122 East 42nd Street New York, NY 10017
DIS	Division of Industrial Safety California Department of Industrial Relations 2422 Arden Way Sacramento, CA 95825
EEI	Edison Electric Institute 90 Park Avenue New York, NY 10016
EIA	Electronic Industries Association 2001 Eye Street N.W. Washington, DC 20006
EJMA	Expansion Joint Manufacturer's Association 331 Madison Avenue New York, NY 10017
ESO	Electrical Safety Orders, California Administrative Code, Title 8, Chap. 4, Subarticle 5 Office of Procurement, Publications Section P.O. Box 20191 8141 Elder Creek Road Sacramento, CA 95820
FEDSPEC	Federal Specifications General Services Administration Specification and Consumer Information Distribution Branch Washington Navy Yard, Bldg. 197 Washington, DC 20407
FEDSTDS	Federal Standards (see FEDSPECS)
FM	Factory Mutual Research 1151 Boston-Providence Turnpike Norwood, MA 02062
HEI	Heat Exchange Institute 122 East 42nd Street New York, NY 10017

<u>Abbreviation</u>	<u>Company</u>
HI	Hydraulic Institute 1230 Keith Building Cleveland, OH 44115
IAPMO	International Association of Plumbing and Mechanical Officials 5032 Alhambra Avenue Los Angeles, CA 90032
ICBO	International Conference of Building Officials 5360 South Workman Mill Road Whittier, CA 90601
ICEA	Insulated Cable Engineers Association P.O. Box P South Yarmouth, MA 02664
IEEE	Institute of Electrical and Electronics Engineers, Inc. 345 East 47th Street New York, NY 10017
IES	Illuminating Engineering Society C/O United Engineering Center 345 East 47th Street New York, NY 10017
ISA	Instrument Society of America 400 Stanwix Street Pittsburgh, PA 15222
JIC	Joint Industrial Council 7901 Westpark Drive McLean, VA 22101
MILSPEC	Military Specifications Naval Publications and Forms Center 5801 Tabor Avenue Philadelphia, PA 19120
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. 127 Park Street, N.E. Vienna, VA 22180

<u>Abbreviation</u>	<u>Company</u>
NAAMM	National Association of Architectural Metal Manufacturers 100 South Marion Street Oak Park, IL 60302
NACE	National Association of Corrosion Engineers P.O. Box 986 Katy, TX 77450
NEC	National Electric Code National Fire Protection Association 470 Atlantic Avenue Boston, MA 02210
NEMA	National Electrical Manufacturer's Association 155 East 44th Street New York, NY 10017
NESC	National Electric Safety Code American National Standards Institute 1430 Broadway New York, NY 10018
NFPA	National Forest Products Association (Formerly called: National Lumber Manufacturer's Association) 1619 Massachusetts Avenue, N.W. Washington, DC 20036
OSHA	Occupational Safety and Health Act U.S. Department of Labor San Francisco Regional Office 450 Golden Gate Avenue, Box 36017 San Francisco, CA 94102
PPIC	The Plumbing & Piping Industry Council, Inc. Suite 402 510 Shatto Place Los Angeles, CA 90020
SAE	Society of Automotive Engineers 2 Pennsylvania Street New York, NY 10001
SAMA	Scientific Apparatus Makers Association

<u>Abbreviation</u>	<u>Company</u>
	One Thomas Circle Washington, DC 20005
SBCC	Southern Building Code Congress 1116 Brown-Marx Building Birmingham, AL 35203
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Inc. 8224 Old Courthouse Road Tysons Corner Vienna, VA 22180
SSPWC	Standard Specifications for Public Works Construction Building News, Inc. 3055 Overland Avenue Los Angeles, CA 90034
TEMA	Tubular Exchanger Manufacturer's Association 331 Madison Avenue New York, NY 10017
UBC	Uniform Building Code Published by ICBO
UL	Underwriters Laboratories Inc. 207 East Ohio Street Chicago, IL 60611
UMC	Uniform Mechanical Code Published by ICBO
UPC	Uniform Plumbing Code Published by IAPMO

Abbreviation

Company

USBR

Bureau of Reclamation  
U.S. Department of Interior  
Engineering and Research Center  
Denver Federal Center, Building 67  
Denver, CO 80225

WWPA

Western Wood Products Association  
(Formerly called: West Coast Lumberman's Association - WCLA)  
Yeon Building  
Portland, CA 97204

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

- END OF SECTION -

## SECTION 01100

### ARCHAEOLOGICAL PROTECTION

#### PART 1 - GENERAL

- 1.1 This section covers the requirements for the protection and preservation of historical sites and values.

#### PART 2 - PRODUCTS (NOT USED)

#### PART 3 - EXECUTION

- 3.1 **CONSTRUCTION METHOD:** Representatives of the State will from time to time examine the area as work proceeds. If historical values are noted, the State may order a halt to the work in the vicinity of the historical values until the State can examine further. The Contractor shall notify the State if he finds anything he suspects to be of historic significance and shall discontinue further work in the vicinity of the find until the State can examine the area. In either case, further work in the vicinity of such historical or suspected historical values may proceed only upon approval by the State. Such approval can be normally expected within one week and shall in no case require more than one month.

END OF SECTION

## SECTION 01300

### SUBMITTALS

#### PART 1 - GENERAL

##### 1.1 SUBMITTALS

A. Shop drawings shall be required for:

1. Reinforcing Steel.
2. Structural Aluminum Framing.
3. Any others as called for in the plans, specifications or by the Engineer.

B. Other required submittals shall include:

1. Contractor's Key Personnel and Emergency Contacts.
2. Project Schedule.
3. Best Management Practices.
4. Demolition and Removal Procedures.
5. Concrete Mix Designs and Test Results; or Manufacturer's product data for prepackaged concrete mix.
6. Manufacturer's catalog data and Certificates of Compliance for products and materials.
7. Certificates of Warranty or Manufacturer's Warranty Documentation.
8. Any others as called for in the plans, specifications, or by the Engineer.

##### 1.2 BIDDER'S SPECIAL RESPONSIBILITY FOR COORDINATING CONTRACTUAL WORK AND SUBMITTALS:

A. The Contractor is responsible for the coordination of all contractual work and submittals.

B. The Contractor shall have a rubber stamp made up in the following format:

CONTRACTOR NAME

PROJECT: \_\_\_\_\_

\_\_\_\_\_

JOB NO: \_\_\_\_\_

THIS SUBMITTAL HAS BEEN CHECKED BY THIS GENERAL CONTRACTOR. IT IS CERTIFIED 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.

DATE RECEIVED \_\_\_\_\_

SPECIFICATION SECTION \_\_\_\_\_

SPECIFICATION PARAGRAPH \_\_\_\_\_

DRAWING NUMBER \_\_\_\_\_

SUBCONTRACTOR NAME \_\_\_\_\_

SUPPLIER NAME \_\_\_\_\_

MANUFACTURER NAME \_\_\_\_\_

CERTIFIED BY: \_\_\_\_\_

- C. This stamp, "filled in", should appear on the title sheet of each shop drawing, on a cover sheet of submittals in an 8-1/2" x 11" format, or on one face of a cardstock tag (min. 3" x 6") tied to each sample. The tag on the samples should state what the sample is so that, if the tag is accidentally separated from the sample, it can be matched up again. The back of this tag will be used by the Engineer for his receipt, review, and log stamp and for any comments that relate to the sample.
- D. All submittals for material, equipment, and shop drawings listed in the contract documents, including dimensioned plumbing shop drawings, shall be required and shall be reviewed by the Engineer, prior to any ordering of materials and equipment.
- E. Unless otherwise noted, the Contractor shall submit to the Engineer for his review eight copies of all shop drawings, piping layout, and/or catalog cuts for fabricated items and manufactured items (including mechanical and electrical equipment) required for the construction. Drawings shall be submitted in sufficient time to allow the Engineer not less than twenty regular working days for examining the drawings.
- F. The drawing shall be accurate, distinct, and complete and shall contain all required information, including satisfactory identification of items, units and assemblies in relation to the contract drawings and specifications.

- G. Unless otherwise approved by the Engineer, shop drawings shall be submitted only by the Contractor, who shall indicate by a signed stamp on the drawings or other approved means that the Contractor has checked the shop drawings and that the work or equipment shown is in accordance with contract requirements and has been checked for dimensions and relationship with work of all other trades involved. All deviations from the plans and specifications shall be listed. The practice of submitting incomplete or unchecked shop drawings for the Engineer to correct or finish will not be acceptable, and shop drawings which, in the opinion of the Engineer, clearly indicate that they have not been checked by the Contractor will be considered as not complying with the intent of the contract documents and will be returned to the Contractor for resubmission in the proper form.
- H. When the shop drawings have been reviewed by the Engineer, two sets of submittals will be returned to the Contractor appropriately stamped. If major changes or corrections are necessary, the drawing may be rejected and one set will be returned to the Contractor with such changes or corrections indicated, and the Contractor shall correct and resubmit eight copies of the drawings, unless otherwise directed by the Engineer. No changes shall be made by the Contractor to the resubmitted shop drawings other than those changes indicated by the Engineer. The resubmittal shall be so indicated on the shop drawing.
- I. The review of such drawings and catalog cuts by the Engineer shall not relieve the Contractor from responsibility for correctness of the dimensions, fabrication details, and space requirements or for deviations from the contract drawings and specifications, unless the Contractor has called attention to such deviations, in writing, by a letter accompanying the drawings and the Engineer approved the change or deviations, in writing, at the time of submission; nor shall review by the Engineer relieve the Contractor from the responsibility for errors in the shop drawings. When the Contractor does call such deviations to the attention of the Engineer, he shall state in his letter whether or not such deviations involve any deduction or extra cost adjustment.
- J. The approval of the above drawings, lists, prints, specifications, or other data shall in no way release the Contractor from his responsibility for the proper fulfillment of the requirements of this contract nor for fulfilling the purpose of the installation nor from his liability to replace the same should it prove defective or fail to meet the specified requirements.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

## SECTION 01505

### MOBILIZATION AND DEMOBILIZATION

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

A. Description: This section covers the requirements for mobilization and demobilization.

1.2 MOBILIZATION: Mobilization shall consist of the transporting, assembling, constructing, installing, and making ready for use at the job site, all the equipment, machinery, structures, utilities, materials, labor, and incidentals necessary to do the work covered by this contract.

1.3 DEMOBILIZATION: Demobilization shall consist of the dismantling and removal of the above-mentioned equipment, machinery, structures, utilities, materials, and incidentals, and the cleaning up of the site.

#### PART 2 - PRODUCTS (NOT USED)

#### PART 3 - EXECUTION

3.1 GUIDELINES: If the Contractor utilizes private lands other than the sites provided by the Department for mobilization purposes, the provisions of this section shall apply, and the mobilization and demobilization work on said private lands shall be in accordance with the agreement between the Contractor and the land owner.

Any and all additional mobilization or demobilization costs in excess of the maximum amounts specified in the Proposal shall be included in the appropriate unit prices bid in the Proposal. The Contractor shall not receive any compensation for mobilization and demobilization in addition to those specified in the Proposal.

All equipment, machinery, buildings, utilities and incidentals mobilized and demobilized under this section shall remain the property of the Contractor.

END OF SECTION

## SECTION 01530

### BARRICADES

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

- A. Description. This work shall consist of furnishing, installing and maintaining barricades in accordance with the requirements of the contract.

Barricade application shall be provided for in the latest edition of the FHWA publication, Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), and as amended.

#### PART 2 - PRODUCTS

##### 2.1 MATERIALS

- A. Lumber: Lumber for rails, frames and braces shall be dry, sound, undamaged, well seasoned, and free from any defect which may impair their strength and durability.
- B. Hardware: Nails shall be galvanized wire nails. As many and as large a size as is practicable shall be used.
- C. Paints: Paints shall be exterior enamel paint of the best grade or first line as made by approved manufacturers.
- D. Sheet Reflecting Material: Sheet reflecting material shall conform to the applicable requirements of Subsection 712.20(C) of the "Standard Specifications for Road and Bridge Construction".
- E. Alternate Designs: Alternate barricade designs such as plastic molded barricades may be used subject to the Engineer's approval. The Contractor shall submit shop drawings or catalog cuts for approval.

#### PART 3 - EXECUTION

##### 3.1 CONSTRUCTION REQUIREMENTS

- A. General: Barricades shall be constructed in a first class, workmanlike manner in accordance with details shown on the plans and as specified herein.

Barricades shall be in good condition and approved by the Engineer for use within the project limits. Barricade application and installation shall be as shown on the plans and as directed by the Engineer in accordance with the guidelines provided in the latest edition of

the FHWA publication, Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD), and any amendments or revisions thereof as may be made from time to time.

Sand bags or other approved weights shall be provided where required or as directed by the Engineer. Sand bags or other approved weights shall not be placed on any striped barricade rail.

Steady burn and/or flashing lamps shall be required on selected barricades used during hours of darkness. Locations shall be as shown on the plans and as directed by the Engineer. Lamps shall be attached on the barricade ends closest to the traveled way and shall be visible to the motorist.

Barricades furnished and paid for as provided for as provided herein may be used for temporary detours, construction phasing, or other temporary traffic control work.

Barricades furnished and paid for use in temporary detours or construction phasing may be used for permanent location called for on the plans.

Upon completion of the construction work, barricades shall be left in place, relocated, or removed and disposed of as shown on the plans or as directed by the Engineer. Barricades left in place, or relocated to new permanent locations shall become the property of the State.

Barricades directed to be removed and disposed of shall become the property of the Contractor.

- B. Painting: Wooden rails, frames and braces shall be given a prime coat and 2 finish coats of new white exterior enamel paint. Rail faces to be reflectorized may be left unpainted unless otherwise specified or directed.
- C. Reflectorization: Reflectorization of barricade rails shall be done in a first class, workmanlike manner and the attachment of reflective sheeting shall be as shown on the plans, specified herein, or as directed and approved by the Engineer.

Both vertical faces of each barricade rail shall be reflectorized as shown on the plans.

Wooden rails shall be reflectorized with one of the following:

1. Reflective sheeting specified in Subsection 712.20(C)(4) of the "Standard Specifications for Road and Bridge Construction" and backed with a 26 gage galvanized steel sheet, or
2. a hardened aluminum backed reflective sheeting as specified in Subsection 712.20(C)(5) of the "Standard Specifications for Road and Bridge Construction."

- D. Color: Rails, frames and braces shall be white.

The front and back faces of barricade rails shall have 6-inch wide alternative colored and white striped sloping downward toward the traveled way at an angle of 45 degrees with the vertical. The colored stripes shall be either orange or red in accordance with the following requirements:

1. Orange and white stripes shall be used in the following conditions:
  - a. Construction work.
  - b. Detours.
  - c. Maintenance work.
2. Red and white stripes shall be used in the following conditions:
  - a. On roadways with no outlet (ie. dead-ends, cul-de-sacs).
  - b. Ramps or lanes closed for operational purposes.
  - c. Permanent or semipermanent closure or termination of a roadway.

- E. Maintenance: Barricades shall be kept in good condition throughout their usage during construction until the end of the contract.

- F. The Contractor shall repair, repaint, clean or replace the barricades as required and as directed by the Engineer to maintain their effectiveness and appearance.

The Constructor shall immediately replace all lost, stolen or damaged barricades, lamps, sand bags and other approved weights.

Barricades used during construction phasing, temporary detours or other temporary traffic control work shall be cleaned and repaired as necessary, prior to being relocated to a permanent location shown on the plans or as directed.

No extra payment will be made for any repair work, repainting, or cleaning of barricades. The Engineer shall determine the suitable condition of each barricade and shall determine when each barricade shall be repaired, repainted or cleaned.

END OF SECTION

## SECTION 01567

### POLLUTION CONTROL

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

###### A. Rubbish Disposal

1. No burning of debris and/or waste materials shall be permitted on the project site.
2. No burying of debris and/or waste material except for materials which are specifically indicated elsewhere in these specifications as suitable for backfill shall be permitted on the project site.
3. All unusable debris and waste material shall be hauled away to an appropriate off-site dump area. During loading operations, debris and waste materials shall be watered down to allay dust.
4. No dry sweeping shall be permitted in cleaning rubbish and fines which can become airborne.
5. Enclosed chutes and/or containers shall be used for conveying debris which could cause dust nuisance, litter, or rubbish.
6. 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.

###### B. Dust

1. The Contractor shall 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 - Air Pollution Control.
2. The method of dust control and costs shall be the responsibility of the Contractor. Methods of dust control shall include the use of water, chemicals or asphalt over surfaces which may create airborne dust.
3. The Contractor shall be responsible for all damage claims in accordance with Section 7.16 - "Responsibility for Damage Claims" of the GENERAL CONDITIONS.

C. Noise

1. 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 for Oahu. The Contractor shall obtain and pay for the Community Noise Permit from the State Department of Health when the construction equipment or other devices emit noise at levels exceeding the allowable limits.
2. All internal combustion engine-powered equipment shall have mufflers to minimize noise and shall be properly maintained to reduce noise to acceptable levels.
3. Starting-up of construction equipment meeting allowable noise limits shall not be done prior to 6:45 a.m. without prior approval of the Engineer. Equipment exceeding allowable noise levels shall not be started-up prior to 7:00 a.m.

D. Erosion

1. During interim grading operations, the grade shall be maintained so as to preclude any damage to adjoining property from water and eroding soil.
2. Temporary berms, cut-off ditches and other provisions which may be required because of the Contractor's method of operations shall be installed at no cost to the State.

E. Others

1. Wherever trucks and/or vehicles leave the site and enter surrounding paved streets, the Contractor shall prevent any material from being carried onto the pavement. Waste water shall not be discharged into existing streams, waterways, or drainage systems such as gutters and catch basins unless treated to comply with the State Department of Health water pollution regulations.
2. Trucks hauling debris shall be covered as required by PUC Regulation. Trucks hauling fine materials shall be covered.
3. No dumping of waste concrete will be permitted at the job-site.
4. Except for rinsing of the hopper and delivery chute, and for wheel washing where required, concrete trucks shall not be cleaned on the job-site.
5. Except in an emergency, such as a mechanical breakdown, all vehicle fueling and maintenance shall be done in a designated area. A temporary berm shall be constructed around the area when runoff can cause a problem.
6. When spray painting is allowed such spray painting shall be done by the "airless spray" process. Other types of spray painting will not be allowed.

F. Suspension of Work

1. Violations of any of the above requirements or any other pollution control requirements which may be specified in the Technical Specifications herein shall be cause for suspension of the work creating such violation. No additional compensation shall be due the Contractor for remedial measures to correct the offense. Also, no extension of time will be granted for delays caused by such suspensions.
2. If no corrective action is taken by the Contractor within 72 hours after a suspension is ordered by the Engineer, the State reserves the right to take whatever action is necessary to correct the situation and to deduct all costs incurred by the State in taking such action from monies due the Contractor.
3. The Engineer may also suspend any operations which he feels are creating pollution problems although they may not be in violation of the above-mentioned requirements. In this instance, the work shall be done by force account as described in Subsection 4.2b - "Additional Work" of the GENERAL CONDITIONS and paid for in accordance with Subsection 8.4b - "Force - Account Work" therein. The count of elapsed working days to be charged against the contract in this situation shall be computed in accordance with Subsection 7.18 - "Contract Time" of the GENERAL CONDITIONS.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

## SECTION 01581

### PROJECT SIGN

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

Furnish all labor, materials and equipment necessary to construct and install all project sign as specified hereinafter.

##### 1.2 SUBMITTAL

The contractor shall provide the Engineer with six (6) shop drawings of the project sign for review and approval by the Engineer prior to ordering the sign.

##### 1.3 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.

##### 1.4 ART WORK

Constant elements of the sign layout - frame, outline, stripe, and official state information - may be duplicated following 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 provided.

##### 1.5 TITLES

The specific major work of the project under construction is emphasized by using 3-3/4" type, all capitals. Secondary information such as location or buildings uses 2-1/4" type, all capitals. Other related information of lesser importance uses letter heights as indicated on 01581-3, upper / lower case letters.

Design should follow the example on page 01581-3.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

#### A. LUMBER

1. Panel is 3/4" exterior grade high density overlaid plywood, with resin-bonded surfaces on both sides.
2. 4"x4" sign posts shall be Douglas Fir No. 1 or better.

#### B. 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)

#### C. CONCRETE

Concrete shall be class B with a 2,500 psi 28-day compressive strength.

## PART 3 - EXECUTION

### 3.1 GENERAL

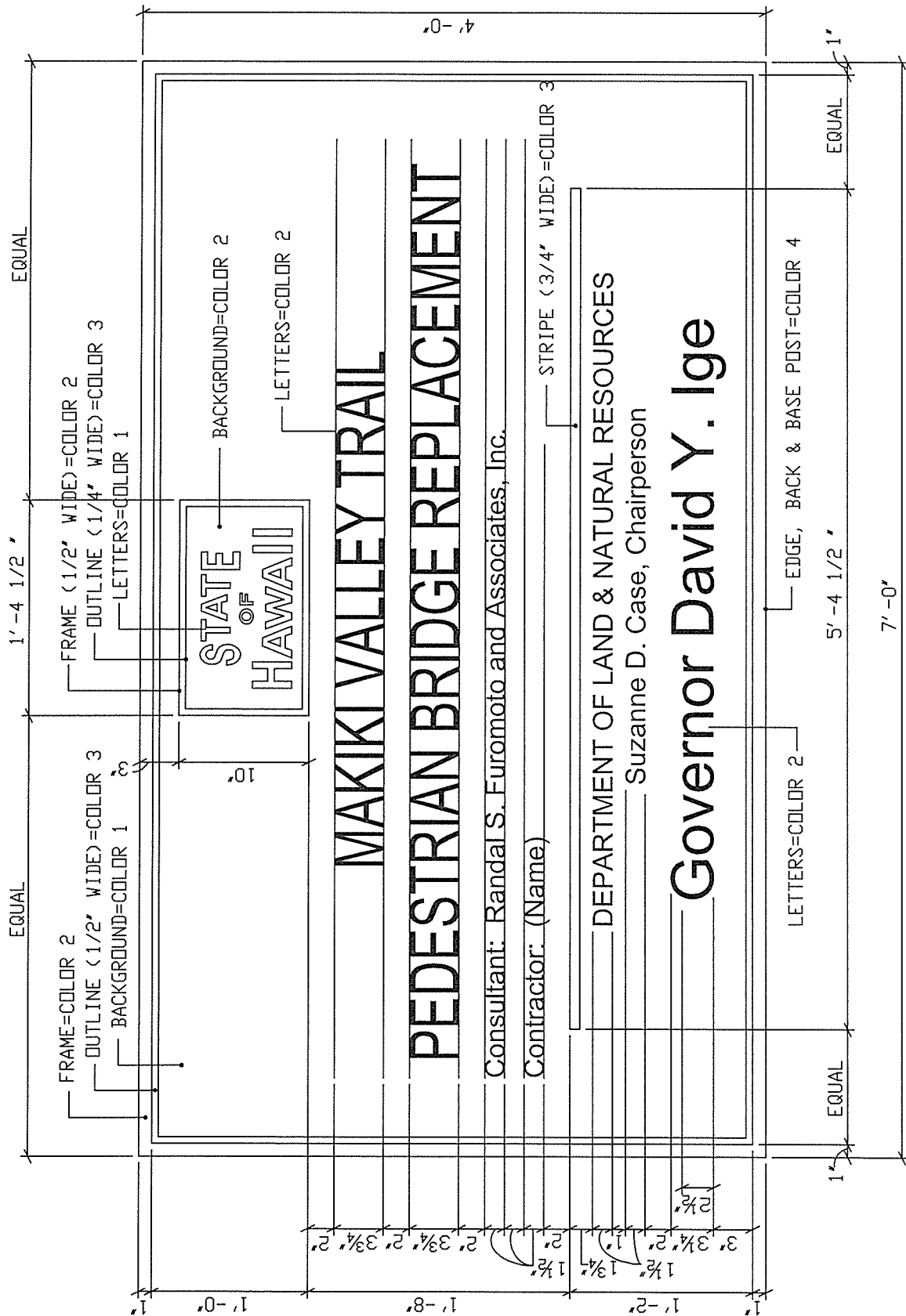
- A. The Project Sign shall be constructed with new materials as specified above.
- B. The Project sign shall be installed at the location indicated on the drawings or as designated by the Engineer.

### 3.2 MEASUREMENTS AND PAYMENT

The construction of the project sign, including all equipment, labor and material necessary to furnish and install the project sign will be paid for under the "Project Sign" proposal item.

END OF SECTION

Project Sign  
01581-2



## DIVISION 2 – SITE WORK

### SECTION 02050

#### DEMOLITION AND REMOVAL

##### PART 1 - GENERAL

- 1.1 **GENERAL REQUIREMENTS:** The work includes demolition and removal as indicated in the plans or specified herein. All materials resulting from demolition work, except as indicated or specified otherwise, shall become the property of the Contractor and shall be removed from the limits of State property. Remove rubbish and debris from the job site daily, unless otherwise directed. Store materials which cannot be removed daily in areas specified by the Engineer. The Contractor shall pay for all necessary permits and certificates that may be required in connection with this work.
- 1.2 **SUBMITTALS:** Submit proposed demolition and removal procedures to the Engineer for approval before work is started. Procedures shall provide for coordination with other work in progress and a detailed description of methods and equipment to be used for each operation, and sequence of operations.
- 1.3 **DUST CONTROL:** Take appropriate action to check the spread of dust to the surrounding area and to avoid the creation of a nuisance in the surrounding area. Do not use water if it results in hazardous or objectionable conditions, such as flooding or pollution. Comply with all dust regulations imposed by local air pollution agencies.
- 1.4 **PROTECTION**
  - A. **Existing Improvements:** Protect existing improvements that are to remain in place, that are to be reused, or that is to remain the property of the Engineer by temporary covers, shoring, bracing, and supports. Repair items damaged during performance of the work or replace with new to the satisfaction of the Engineer. Do not overload structural elements. Provide new supports or reinforcement for existing construction weakened by demolition, removal, and relocation work. Construction equipment and vehicles shall neither be permitted on, nor shall be stored on the existing work that is to remain in place.
  - B. **Trees:** Protect trees within the project site which might be damaged during the work.
  - C. **Public Safety:** Where pedestrian and driver safety is endangered in the work or storage areas, use traffic barricades with flashing lights. Notify the Engineer prior to beginning any such work. The Contractor shall conduct operations with minimum interference to streets, driveways, sidewalks, and passageways, etc.
  - D. **Explosives:** Use of explosives will not be permitted.

## PART 2 - PRODUCTS (NOT USED)

## PART 3 - EXECUTION

### 3.1 DEMOLITION AND REMOVAL OF EXISTING ITEMS

- A. Demolish and remove existing structures and other items as indicated on the plans, or if not specifically indicated, to the extent required to accommodate new work. All glass and other materials that could become hazardous when demolished shall be removed prior to demolition. Old bridge components and concrete shall be removed in sections as large as practicable to prevent the contamination of the surrounding area with dust and debris. Cover adjacent ground, trees, and plants with plastic sheeting. Exercise care during demolition and employ methods to preserve items to remain. Any damage caused by the contractor to existing items to remain shall be restored to preconstruction condition or better at no additional cost to the State.
- B. The existing on-grade and below grade utilities shall be secured (capped) and remain in place. Seal and cap utility lines where necessary as required by regulations of the authority having jurisdiction.
- C. The existence of active utility lines traversing the construction area other than those indicated is not definitely known. Should any be encountered, the Contractor shall not disconnect same without authorization of the Engineer, but shall inform the latter immediately of each discovery, and shall follow his instructions.

### 3.2 SAFETY

- A. Work shall be done in accordance with safety provisions of the Manual of Accident Prevention in Construction, published by the Associated General Contractors of America.

### 3.3 DISPOSITION OF MATERIALS

- A. Title to Materials: Title to all materials and equipment to be removed, except as specified otherwise, is vested in the Contractor upon receipt of notice to proceed. The Engineer will not be responsible for the condition or loss of, or damage to, such property after notice to proceed. Materials and equipment shall not be viewed by prospective purchasers or sold on the site. Burning or burying of materials on the site will not be permitted.
- B. When removing the materials from the property, truck loads shall be trimmed and loaded as to prevent spillage.
- D. Demolished materials shall be promptly removed and properly disposed. Stockpiling of construction debris and waste materials at the jobsite shall not be permitted.

3.4 CLEAN UP

- A. Debris and Rubbish: Remove and transport debris and rubbish in a manner that will prevent spillage into the intermittent stream and onto adjacent areas. The Contractor shall leave the premises clean, neat, and orderly.
- B. Regulations: Comply with Federal, State, and Local hauling and disposal regulations.

END OF SECTION

SECTION 02100

SITE PREPARATION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

The work to be performed under this section shall include clearing and grubbing within the project limits of all obstacles, obstructions and vegetation, the removal of which will be necessary for the proper reception, construction, execution and completion of the other work included in this contract.

1.2 COORDINATION WITH OTHER SECTIONS

- A. Earthwork is specified in Section 02200 - EARTHWORK.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 GENERAL

- A. Maintenance of Traffic: The Contractor shall conduct operations with minimum interference to streets, driveways, sidewalks, passageways, etc.

When necessary, the Contractor shall provide and erect barriers, etc., with special attention to protection of personnel.

- B. Protection: Throughout the progress of the work protection shall be provided for all property and equipment, and temporary barricades shall be provided as necessary. Work shall be done in accordance with the safety provisions 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 Standards, Rules and Regulations.
- C. Fires: No burning of fires of any kind will be allowed.
- D. Reference Points: Bench marks, etc., shall be carefully maintained, but if disturbed or destroyed, shall be replaced as directed, at the Contractor's expense.
- E. Disposal: All materials resultant from operations under this Section shall become the property of the Contractor and shall be removed from the site. Loads of materials shall be trimmed to prevent droppings.

### 3.2 EXISTING UTILITY LINES

- A. The existence of active underground utility lines within the construction area is not definitely known other than those indicated in their approximate locations on the Drawings. Should any unknown line be encountered during excavation, the Contractor shall immediately notify the Engineer of such discovery. The Engineer shall then investigate and issue instructions for the preservation or disposition of the unknown line. Authorization for extra work shall be issued by the Engineer only as he deems necessary.

### 3.3 CLEARING AND GRUBBING

- A. The Contractor shall clear the premises of all obstacles, obstructions and vegetation, the removal of which will be necessary for the proper reception, construction, execution and completion of other work included in this contract.
- B. After clearing has been completed, only the areas at the abutments shall be stripped of organically contaminated near-surface soils to a minimum depth of 6 inches. Remove tree roots to a minimum depth of 2 feet below existing ground level. Prune and remove large roots in excess of 2 inches in diameter at least one foot beyond the limits of the abutment foundation. Backfill resulting depressions with aggregate base course compacted to at least 95% compaction. All debris accumulated from this operation shall be completely removed from the premises by the Contractor.
- C. The Contractor shall protect from injury and damage all surrounding trees, plants, etc., and shall leave all in as good as condition as at present. Any damage to existing improvement shall be repaired or replaced by the Contractor to the satisfaction of the Engineer.

### 3.4 CLEAN UP OF PREMISES

- A. Clean up and remove all debris accumulated from building operations from time-to-time as directed. Upon completion of the construction work and before final acceptance of the contract work, remove all surplus materials, equipment, scaffoldings, etc., and leave entire job site raked clean and neat to the satisfaction of the Engineer.

END OF SECTION

## SECTION 02200

### EARTHWORK

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

This section covers the requirements for earthwork.

- A. It shall be the responsibility of the Contractor to examine the project site and determine for himself the existing conditions.
- B. Obvious conditions of the site existing on the date of the bid opening shall be accepted as part of the work, even though they may not be clearly indicated on the drawings and/or described herein or may vary therefrom.
- C. All debris of any kind accumulated from clearing shall be disposed of from the site, and the whole area left clean. The Contractor shall be required to make all necessary arrangements relative to the proposed place of disposal.

##### 1.2 REMOVAL AND REPAIR WORK

###### A. General

The Contractor shall exercise every precaution to preserve and protect all structures, walkways, utilities, and other improvements which are to remain or be relocated. Restore all damages upon completion of the work.

##### 1.3 SEQUENCE OF WORK

All sequence of work shall be subject to the approval of the Engineer.

##### 1.4 PROTECTION

- A. Barricades: Erect temporary barricades to prevent people from entering into project area, to the extent as approved by the Engineer. Such barricades shall be as defined in Section 01530 - BARRICADES. The extent of barricades may be adjusted as necessary with the approval of the Engineer. This work shall be accomplished at no extra cost to the State.
- B. Take all precautions and safety measures as required to protect the State free and harmless from liability of any kind. Conduct operations with minimum interference to streets, driveways, sidewalks, adjoining trails, etc.

- C. Adequate precautions shall be taken before commencing and during the course of the work to ensure the protection of life, limb, and property.
- D. The Contractor shall protect from damage all surrounding structures, trees, plants, grass, walks, pavements, etc. to remain. Any damage will be repaired or replaced by the Contractor to the satisfaction of the Engineer.

#### 1.5 PERMITS

The Contractor shall obtain and pay for necessary permits prior to the commencement of work.

#### 1.6 MAINTAINING TRAFFIC

- A. The Contractor shall conduct operations with minimum interference to streets, driveways, sidewalks, traffic activities, adjoining trails, etc.
- B. When necessary, the Contractor shall provide, erect and maintain lights, barriers, etc., as required by traffic and safety regulations with special attention to protection of life.
- C. Contractor shall provide flaggers at both approaches when necessary to temporarily obstruct or interfere with roadway traffic.

#### 1.7 CONSTRUCTION LINES, LEVELS AND GRADES

- A. The Contractor shall verify all lines, levels and elevations indicated on the drawings before any clearing, excavation or construction begins. Any discrepancy shall be immediately brought to the attention of the Engineer and any changes shall be made in accordance with his instructions. The Contractor shall not be entitled to extra payment if he fails to report the discrepancies before proceeding with any work whether within the area affected or not.
- B. The laying out of base lines, establishment of grades and staking out the entire work shall be done by a licensed Surveyor or a licensed Civil Engineer, registered in the State of Hawaii. He shall be solely responsible for their accuracy. Erect and maintain substantial batter boards showing construction lines and levels.

#### 1.8 CLEANUP

Clean up and remove all debris accumulated from construction operations from time to time, when as directed by the Engineer. Upon completion of the construction work and before final acceptance of work, remove all surplus materials, equipment, etc. and leave entire jobsite, trails used for access, and trail head clean and neat.

## PART 2 - PRODUCTS

### 2.1 MATERIALS

- A. Yard Fill: Yard fill shall be soil with expansion value not greater than 3%, free from debris, perishable or combustible materials, sod and stones larger than 6 inches in maximum dimension. Rocks shall be well distributed in earth or other fine material with voids solidly filled. Rocks shall be embedded at least 6 inches below finish grade.
- B. Structural Fill: Structural fill shall be select borrow material. This material shall be granular with an expansion value not greater than 3%, non-adobe and with a plasticity index less than ten. Decayed rubbish, debris, or rocks greater than 3" in diameter shall not be allowed as structural fill material. Certificate of compliance shall be submitted to the Engineer for approval prior to filling.
- C. Topsoil: Imported, fertile, friable soil of loamy character having normal amounts of natural humus, free from subsoil, clay, refuse, roots, weeds, noxious seeds, nematodes or other deleterious matter, and free from toxic amounts of either acid or alkaline elements and capable of sustaining healthy plant life. Stones and earth lumps shall not be greater than one inch in largest dimension. Topsoil shall be similar to on-site soil in color and character. Red humic latosol soils, or types known as "Palolo clay" or Lualualei clay" are unacceptable. Topsoil is subject to approval by Engineer.

## PART 3 - EXECUTION

### 3.1 EXCAVATION

- A. Protective Measures
  - 1. All excavation shall be protected and guarded against danger to life, limb and property.
  - 2. Shoring, cribbing and logging, as required to safely preserve the excavations and earth banks, free from damages resulting from the work shall be provided and installed by the Contractor.
  - 3. All excavations shall be kept free from standing water. The Contractor shall do all pumping and draining that may be necessary to remove water to the extent required in carrying on the work. Grading shall be controlled so that the ground surface is properly sloped to prevent water run-off into structural foundations and open trenching excavations.
  - 4. The underground utilities lines traversing the construction area known to exist by the designer are indicated on the plans. Should any be encountered during

excavation, the Contractor shall not disconnect same without authorization from the Engineer but shall inform the latter immediately of each discovery. The Engineer shall investigate and issue proper authorization for procedure.

B. General

1. Excavation shall be done to the lines and grades indicated. Concrete slabs, concrete curbs, asphaltic concrete pavement, etc., not indicated to remain shall be removed and disposed.
2. Excavation for footings, foundation, etc., shall have level beds on unfilled, undisturbed, firm bearing, with stepped level where necessary. Small soft spots shall be compacted to unyielding firmness.
3. If soil conditions are suitable and approved, footing cuts may be made to exact size of footing.
4. Structural excavations carried below specified level shall be filled with concrete to the proper level at the expense of the Contractor.
5. Excavated materials declared unusable by Engineer shall be removed from the site and properly disposed at the Contractor's expense.

3.2 FILL AND BACKFILL

A. Yard Fill for Trail Areas

1. Yard fill shall be used to fill areas where no pavement or slab occurs. Yard fill shall be placed in 8" loose lifts and compacted to 90% maximum density as determined by ASTM D1557.
2. The areas not covered by pavements or slabs shall be graded to conform to finish contours, with allowance for depth of topsoil, as required. Rough grading shall prevent the drainage of water into construction areas. Finish grades shall provide for and maintain the drainage pattern.

B. Subgrade Preparation and Structure Backfill

1. In advance of preparing the subgrade or depositing a specified layer of material, existing material within the area where such materials is to be placed, which in the opinion of the Engineer is unsuitable as subgrade, shall be removed to a depth of at least 12 inches and the resulting space backfilled with approved material.
2. Subgrade shall be firm and unyielding. If bedrock is encountered, it shall be removed to provide for the footing dimensions indicated. Uneven rock or boulders shall be removed to provide for a level foundation. Removal of rocks

- and boulders shall be provided at no additional cost to the State.
3. Scarify loose or yielding subgrade to a depth of 6" and recompact to at least 90% maximum density as determined by ASTM D1557.
  4. Aggregate base course shall be used to replace unsuitable subgrade material under structures as directed by the Engineer. Aggregate base course shall be placed in layers not to exceed 6" per compacted layer and compacted to at least 95% maximum density as determined by ASTM D1557.
  5. Structural fill shall be used for backfilling against structures with allowance for depth of topsoil. Structural fill material shall be placed in layers not to exceed 6" per compacted layer and compacted to at least 90% maximum density as determined by ASTM D1557.
  6. Backfilling shall progress so that excessive unbalanced load is not introduced against any structure.
  7. Materials and compaction of all fill and backfill shall be tested by an independent testing agency approved by the Engineer and all after-compaction test results submitted to the Engineer for approval. All cost of testing shall be borne by the Contractor. Testing shall be made for each compacted lift as directed by the Engineer. All test results must be approved before proceeding with placing of topsoil.
  8. It is expected that insufficient amount of acceptable fill material will be derived from earthwork operations. The Contractor shall import the necessary materials without any additional cost to the State. Such imported material shall meet the requirements as specified for each category of materials.

#### C. Grading

1. Rough Grading: The areas within the contract zone limit shall be graded to receive topsoil. Contractor shall take the necessary precautions to prevent the drainage of water into construction area.
2. Finish Grading: Areas to be left exposed shall be graded to finish grade and contours with allowance for a 4" thick layer of topsoil. Grading shall conform with the ordinances of the applicable County. Compact trail areas as specified above and provide topsoil if required to match surrounding in-situ soils. Compact other forest areas receiving topsoil to 85% of maximum density in order to promote regrowth of natural vegetation. Spread topsoil evenly, compact lightly and rake to a uniform surface at required contours and grades. Finish grades shall maintain the drainage pattern.

### 3.3 RESTORATION

- A. Restore damaged areas with compacted topsoil similar to adjoining areas. No new grassing or planting is required, however, vegetation shall be restored if uprooted or removed resulting in bare areas extending more than 5 feet from perimeter of abutments, except for trail.
- B. If planting is necessary it shall be maintained until established. Maintenance shall continue until acceptance of the project or vegetation is established, whichever occurs later.

END OF SECTION

## DIVISION 3 - CONCRETE

### SECTION 03210

#### CONCRETE REINFORCEMENT

##### PART 1 - GENERAL

###### 1.1 DESCRIPTION OF WORK

Work under this section consists of furnishing and installing concrete reinforcement in accordance with these specifications, at the locations and of the shapes and dimensions shown on the plans.

###### 1.2 SUBMITTALS

Contractor shall submit eight (8) sets of the following for review and approval prior to ordering reinforcing steel:

- A. Mill Certificates and Bend Tests: Submit mill certificates indicating material composition, tensile strength results, and bend test results demonstrating compliance with the requirements specified herein.
- B. Welder's Certificates of Qualification: Submit welder's certificates of qualification prior to commencing with any welding work on reinforcing steel.
- C. Shop Drawings: Submit reinforcing steel shop drawings depicting layouts, bar sizes, lengths, quantities, spacing, bends, laps and offsets.

##### PART 2 - MATERIALS

###### 2.1 MATERIALS

- A. Reinforcing steel shall be uncoated deformed bars conforming to ASTM A615 Grade 60. Reinforcing steel to be welded shall conform to ASTM A706.
- B. Metal accessories such as spacers, chairs, ties, and other devices necessary for proper placement, support and fastening of reinforcement in place shall be provided. Plain wire ties not less than 16-gauge shall be used to secure reinforcement. Chairs and spacers to secure reinforcing and maintain spacing from forms shall have epoxy or plastic coated feet.
- C. Concrete chairs of same compressive strength as the concrete to be poured shall be used to support reinforcing steel placed on subgrade or base materials.

## PART 3 - EXECUTION

### 3.1 TOLERANCES

- A. Bars used for concrete reinforcement shall meet the following requirements for fabricating tolerances:

Sheared length:	+1"
Depth of truss bars:	+0, -1/2"
Overall dimensions of stirrups, ties, and spirals:	+1/2"
All other bends:	+1"

- B. Bars shall be placed to the following tolerances:

Clear distance to formed surfaces:	+1/4"
Minimum spacing between bars:	-1/4"

Top bars in horizontal members and footings:

Members 8 inches deep or less:	+1/4"
Members more than 8 inches but not over 2 feet in depth:	+1/2"
Members more than 2 feet deep:	+1"

Crosswise of members:	Spaced evenly within 2"
Lengthwise of members:	+2"

- C. Bars may be moved as necessary to avoid interference with other reinforcing steel, conduits, or embedded items. If bars are moved more than one bar diameter, or enough to exceed the above tolerances, the resulting arrangement of bars shall be subject to approval by the Engineer.

### 3.2 FABRICATION AND INSTALLATION

- A. Reinforcing steel bars shall be fabricated, cut and bent in the shop in the sizes, lengths and configurations as indicated on plans. Reinforcing shall be protected from abrasion, damage and the weather until installed. Clean free of oil, debris and excess rust. Reinforcing steel with loose or flaky rust, or significant section loss will be rejected.
- B. Reinforcement shall be placed in specified positions not exceeding the tolerances listed in paragraph 3.1.
- C. Metal supports and spacers shall be used to properly space reinforcement and maintain clearances to formwork. Stirrups shall be accurately and securely fastened to longitudinal bars at both top and bottom. At bottom of slabs and footings cast directly against earth or base materials, precast concrete blocks of equal or greater compressive strength to the concrete to be poured (not bricks or concrete masonry units) shall be used to support reinforcement.

- D. Bars shall be tied at all intersections, and adequately supported to maintain required clearances from forms and earth. Plain annealed steel wire of not less than 16-gauge devices shall be used to secure reinforcement. Spacing of supports shall be such that the reinforcing is maintained in proper alignment and proper elevation taking into account the weight of workmen and equipment used.
- E. All reinforcing steel bars shall be furnished in continuous lengths wherever possible. Splices shall be as indicated on the plans and, where not indicated, shall be subject to approval of the Engineer. For other than wall and slab temperature reinforcement, splices, where permitted, shall be staggered as far as possible, wired together in such a manner as to maintain the clear depth of the member and the minimum clear distance to the surface of concrete, and shall be lapped in lengths as indicated on the plans or, if not otherwise indicated, not less than 40 bar diameters.
- F. Welding of reinforcing steel shall not be permitted unless approved in advance by the Engineer. Welding of reinforcing steel shall conform to AWS D1.4.
- G. Main vertical bars in columns, walls, and similar members shall be offset at least one bar diameter at lap splices.
- H. Unless permitted by the Engineer or indicated on the plans, reinforcement shall not be bent after being partially embedded in hardened concrete. Improperly and/or excessively bent bars shall be replaced.
- I. Unless otherwise indicated minimum concrete protective covering for reinforcement shall be 3" to earth or base materials, 2" to side forms and at top of footings, and 2" to sides and top of concrete pedestals, walls and columns.
- J. Rebar dowels set in epoxy shall be installed at connections to existing concrete or masonry as detailed or directed.
- K. All reinforcement shall be inspected and approved by the Engineer prior to the closing of forms. This approval, however, shall not be construed to relieve the Contractor of his responsibility to place all reinforcement in accordance with the plans. No concrete shall be poured until the required special inspections have been performed and all corrective actions have been made. Contractor shall submit a tentative schedule of concrete pours updated weekly, and notify the Engineer at least 2 working days prior to all concrete pours. If insufficient notice is given or corrections are required, concrete pour shall be delayed to provide for the required inspections. No additional compensation or time extension will be allowed for delay caused by insufficient notice or corrective work.

END OF SECTION

## SECTION 03300

### CAST-IN-PLACE CONCRETE

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing all labor, materials and equipment necessary to construct cast-in-place concrete as shown on the plans and as specified herein.

##### 1.2 STORAGE OF MATERIALS:

Cement and aggregates shall be stored in such a manner as to prevent their deterioration or the intrusion of foreign matter. Any material which has deteriorated or which has been damaged shall not be used for concrete and shall be promptly removed from the site.

##### 1.3 SUBMITTALS:

Submit eight (8) sets of the following items:

- A. **Manufacturer's Certificates of Compliance:** Submit certificates of compliance for all materials used in concrete work to include, but not limited to, Portland cement, aggregates, admixtures, curing compound, bonding agents, and colorant.
- B. **Concrete Mix Designs:** Submit proposed concrete mix designs for all classes of concrete to be used in the work. Mix designs shall be reviewed and accepted by the Engineer in writing prior to use in the work. No change in accepted concrete mix designs shall be made without the prior approval of the Engineer.
- C. **Test Results:** Submit test results for all testing specified herein. All testing shall be performed by an approved independent materials testing laboratory and cost of testing shall be borne by the Contractor.
- D. **Manufacturer's Product Data:** Submit manufacturer's catalog data, material certifications, mixing instructions, color chart, and test data for colorant admixture and prepackaged concrete mix (if used).

##### 1.4 SAMPLE PANELS:

Construct 12" by 12" sample panels of color conditioned concrete for color selected by the Engineer from the manufacturer's color chart. Three sample panels shall be provided with different dosages of colorant. Should the samples be deemed unacceptable, an additional set of sample panels shall be prepared for an alternate color selected by the Engineer at no additional cost to the State. Selected color conditioned concrete sample panel shall be stored for reference by the Contractor until final acceptance of the project.

## 1.5 TESTS:

- A. General: Testing applies to ready mixed or jobsite mixed concrete. No testing is required if prepackaged concrete mix is used.
- B. Slump: Standard slump tests as described in ASTM C143 (Modification: Sampling of concrete for slump test shall be taken after at least 1/4 cubic yard of concrete has been discharged) shall be made periodically during the placement of concrete (not less than one slump test for every truck when ready mixed concrete is used). Any concrete batch tested and showing slumps exceeding the specified tolerance shall be rejected. Any concrete placed prior to slump testing shall be the sole responsibility of the Contractor and shall be rejected should the subsequent slump test of the batch in question indicate that the slump tolerance is being exceeded. All rejected concrete shall be promptly removed and properly replaced. All costs resulting therefrom shall be borne by the Contractor.
- C. Compressive Strength: Compressive strength testing of concrete shall be required in accordance with ASTM C39 for any concrete mix with specified minimum compressive strength at 28 days (f'c) of 3,000 psi or higher. A minimum of four 6-inch x 12-inch cylinder test specimens shall be made from each concrete pour with additional sets taken at a rate of 4 cylinders for each additional 50 cubic yards. Notwithstanding this established rate, however, the Engineer may direct the Contractor to take additional concrete test specimens should there be an observed change in consistency or appearance of the concrete mix.
  - 1. The Contractor shall make and identify all test specimens, and deliver to the approved independent materials testing laboratory.
  - 2. The standard age for testing shall be one at 7 days and two at 28 days. The remaining test specimen shall be held in reserve and tested at 56 days or as directed should the results of the 28 day tests be deficient.
  - 3. All test specimens shall be made and cured in accordance with ASTM C31.
  - 4. The minimum strength requirements shall be considered satisfied if the average compressive strength of the two 28 day test specimens from each set equals or exceeds the specified minimum 28 day compressive strength and no individual strength test falls more than 500 psi below the specified strength.
  - 5. In all cases where the strength of any pair of 28 day tests falls below the minimum compressive strength specified, the remaining test specimen shall be tested at 56 days or as directed by the Engineer. Should this test specimen attain the specified 28 day compressive strength, the batch will be considered to meet the strength requirements. However, if the results fall below the 28 day strength specified, the Engineer shall have the right to require that test specimens be cut from the structure. Specimens shall be selected by the Engineer from the location in the structure represented by the deficient test. Specimens shall be secured, prepared, and tested in accordance with ASTM C42 within a period of 60 days after placing the concrete. The testing shall be done by the approved independent testing laboratory. Concrete in the area represented by the core tests will be considered structurally adequate if the average strength of 3 cores is no less

than 85 percent and the strength of a single core is no less than 75 percent of the 28-day strength specified. Should laboratory analysis indicate that the concrete does not meet the strength required all such concrete placed using the deficient mix shall be subject to rejection. The cost of cutting specimens from the structure, patching the resulting holes, and making the analysis, including laboratory and consultation costs, shall be borne by the Contractor. If the concrete is accepted, the holes from which the cored samples are taken shall be packed solid with no-slump concrete proportioned in accordance with the ACI 221 "Recommended Practice for Selecting Proportions of No-Slump Concrete." The patching concrete shall have an "extremely dry" consistency and the same design strength as the specified concrete.

6. If the strength of the specimens cut from the structure falls below the requirements stipulated above, the Engineer shall have the right to require any and all defective concrete be replaced, and all costs resulting therefrom shall be borne by the Contractor at no additional cost to the State.

## PART 2 - MATERIALS

### 2.1 MATERIALS:

- A. Portland cement shall conform to the requirements of ASTM C150, Type I or II, except that only Type II cement and/or modified Type I cement containing not more than 8 percent tricalcium aluminate shall be used for concrete for sewerage structures.
- B. Concrete Aggregates:
  1. Fine aggregates shall be basalt or calcareous sands, or a combination thereof, except that calcareous sands shall not be used for sewage structures. They shall meet the grading requirements of ASTM C33 unless the concrete producer can provide past data that shows that a proposed non-conforming gradation will produce concrete with the required strength and suitable workability.
  2. Coarse Aggregates shall be crushed close-grained, blue lava rock meeting the grading requirements of ASTM D448, size 57 or 67 except that the maximum size of aggregates shall not be larger than 1/5 of the narrowest dimension between sides of the forms of the member for which the concrete is to be used, nor larger than 3/4 of the minimum clear spacing between individual reinforcing bars or bundles of bars, nor one inch.
- C. Water used in mixing concrete shall be fresh, clean and potable.
- D. Water reducing or, water reducing and set retarding admixture shall conform to ASTM C494, Type A or D shall be added to all ready mixed concrete. Air entraining admixture, if used, shall conform to ASTM C260. All admixtures shall be mixed in proper amount in accordance with directions of the manufacturer. Admixtures containing chlorides shall not be used.
- E. Colorant for color conditioned concrete shall conform to ASTM C979, "Chromix" by L. M. Scofield Company or accepted equal.

- F. Curing compound shall conform to ASTM C309 Type 1, and be applied in accordance with manufacturer's instructions and recommendations. The curing compound shall be compatible with the finish materials to be received.
- G. Form release agent shall be of a type compatible with the finishes to be applied, or shall be completely removed from the concrete surfaces prior to application of the required finish materials.

PART 3 - EXECUTION

3.1 DESIGN OF CONCRETE MIXES:

- A. Ingredients for concrete shall be Portland cement, fine and coarse aggregates, admixtures and water. Prepackaged concrete mix shall be manufacturer's formula and shall not be modified by the contractor except for addition of colorant admixture. Should it be determined that color conditioned concrete using prepackaged concrete mix will not produce concrete of the color desired, job mix using a blend of normal and white Portland cement shall be provided.
- B. Only concrete with normal weight aggregates shall be used.
- C. Concrete shall be designed so that the concrete materials will not segregate nor cause excessive bleeding. Slump shall be between 3 to 4 inches.
- D. The concrete mix shall meet the following minimum requirements:

Class	Maximum Water-Cement Ratio (lb./lb.)	Min. 28 Day Compressive Strength (psi)	Typical Locations Where Mix Is To Be Used
A	0.55	3,000	All structural concrete.

- E. A water-reducing and/or water reducing and set retarding admixture and, if required, an air-entraining admixture to provide satisfactory workability of the concrete shall be added ready mixed concrete at the batch plant. Colorant admixture shall be added in accordance with manufacturer's instructions and recommendations. The use of admixtures shall in no way result in the reduction of the amount of Portland cement used.

3.2 JOINTS:

- A. Construction joints shall be provided as detailed at locations indicated on the plans. Construction joint locations not shown on the plans shall be so made as to least impair the strength of the structure and shall be subject to acceptance of the Engineer. Joints shall be perpendicular to the main reinforcement, cleaned free of laitance, and intentionally roughened for bond.

- B. All reinforcing steel shall be continuous across construction joints. Keyways and dowels shall be provided as detailed or directed. Continuous longitudinal keyways at least 1-1/2" deep shall be provided in all construction joints in walls and between walls and slabs or footings.

### 3.3 MIXING CONCRETE:

- A. All ready mixed concrete shall be produced by an approved batching plant and delivered in concrete mixer trucks to insure uniformity and homogeneity of the concrete mix. Contractor shall coordinate delivery to provide a sufficient quantity of concrete to continuously carry on the work and deposit concrete within the allowable time limits for each batch.
- B. Due to small quantity and jobsite location concrete may be mixed at the jobsite. If prepackaged concrete mix is used, all manufacturer's instructions and recommendations shall be followed. Jobsite mixing shall be done in accordance within ACI 614 and as follows:
  - 1. Concrete shall be thoroughly mixed in a batch mixer of an approved type and size which will insure a uniform distribution of materials throughout the mass. The machine shall have a control device to prevent materials from being discharged until they have been mixed for the specified minimum time.
  - 2. The entire contents of the drum shall be discharged before materials of the succeeding batch are placed therein. No mixer shall be used which has a rated capacity of less than one sack batch and no mixer shall be charged in excess of its rated capacity.
  - 3. The first batch of materials placed in the mixer after the machine has been cleaned shall contain a sufficient excess of cement, sand and water to coat the inside of the drum without reducing the required mortar content of the mix. Upon cessation of mixing, the mixer shall be thoroughly cleaned.
- C. Ready Mixed and Mixed-In-Transit Concrete shall be mixed to conform to the provisions of ASTM C94 and as follows:
  - 1. The plant shall have sufficient capacity and transportation equipment to deliver concrete at the rate desired. The interval between batches for a pour shall not exceed 30 minutes.
  - 2. The time elapsed between the introduction of the mixing water to the cement and aggregates or the cement to the aggregates, and the placing of concrete in its final position shall not exceed 90 minutes.
  - 3. In hot weather (more than 90 degrees F) or under conditions contributing to quick stiffening of the concrete, the elapsed time in Paragraph C.2. above, shall not exceed 60 minutes if no retarding admixture is used. If an ASTM C494, Type B or D admixture is added to the concrete, the maximum elapsed time shall remain at 90 minutes.
- D. Concrete shall be mixed only in such quantity as is required for immediate use. No retempering will be permitted and concrete that has started to harden shall be discarded and promptly removed from the job.

- E. Admixtures conforming to Paragraph 2.1 shall be used in the concrete as recommended by the supplier and accepted by the Engineer.
- F. Hand mixing of concrete may be permitted for prepackaged concrete only provided that sufficient labor and equipment are provided to maintain a continuous pour.

### 3.4 PLACING CONCRETE:

- A. No concrete shall be placed in the absence of the Engineer or his representative who shall be given at least two working days advance notice of starting time of concrete pour. Place no concrete until foundation, forms, reinforcing steel, pipes, conduits, sleeves, hangers, anchors, inserts, waterproofing, ground treatment and other work required to be built into or placed ahead of concrete placing have been inspected and approved by the Engineer or his representative. Concrete placed without such notice and approval shall be rejected, removed and replaced at the expense of the Contractor.
- B. Preparation:
  - 1. All sawdust, chips and other construction debris and extraneous matter shall be removed from interior of forms. Struts, stays, bracing, or blocking serving temporarily to hold forms in correct shape or alignment shall be removed when the concrete placing has reached an elevation rendering their services unnecessary.
  - 2. Concrete shall be placed upon clean, damp surfaces with no free water, or upon properly compacted fills but never upon soft mud or dry, porous earth. Before pouring footings or foundations, bottoms of excavations shall be properly leveled off and tamped.
  - 3. Before depositing new concrete on or against concrete which has set, all accumulations of mortar splashed upon reinforcing steel and the surfaces of forms shall be removed and the forms shall be retightened. The surfaces of previously set concrete shall be thoroughly roughened and cleaned of all foreign matter and laitance, saturated with water and slushed with a coat of cement grout. New concrete shall be placed before the grout has attained its initial set.
- C. Conveying:
  - 1. Concrete shall be conveyed from mixer to forms as rapidly as practicable by methods that will prevent segregation.
  - 2. Concrete shall be deposited as nearly as practicable in its final position. Extensive spading as a means of transportation shall be avoided and in no case shall vibrators be used to transport concrete inside the forms.
  - 3. Open troughs and chutes shall have a slope not to exceed one vertical to 2 horizontal and not less than one vertical and 3 horizontal. Chutes more than 20 feet long and chutes not meeting the slope requirements may be used provided they discharge into a hopper before distribution.

4. The concrete shall not be allowed to drop freely more than 6 feet except where authorized by the Engineer. When placing operations would involve the dropping of concrete from a height of more than 6 feet, it shall be conveyed through pipes or flexible drop chutes.
5. If any appreciable segregation occurs through the conveying methods employed, their use shall be discontinued and some other satisfactory method of placing concrete shall be used.
6. All chutes, troughs, pipes and other means of conveyances shall be kept clean from coatings of hardened cement or concrete by thoroughly cleaning with water and chipping after each pour. Water used for flushing shall be discharged away from the vicinity of the concrete or forms already in place.

D. Depositing:

1. Unless adequate protection is provided, concrete shall not be placed during rain. Rainwater shall not be allowed to increase the mixing water nor to damage the surface finish. Fresh concrete that has been deposited but has not attained its initial set shall be protected in the event of rain.
2. Concrete shall be placed so as to avoid segregation of the materials and the displacement of the reinforcing. As nearly as practicable, the concrete shall be dropped vertically without hitting reinforcement, sleeves or forms into its final position in order to avoid segregation of coarse aggregates from concrete. After the initial set of concrete, the forms shall not be jarred and no strain shall be placed on the projecting reinforcing.
3. Except for vertical members, formed concrete shall be deposited in horizontal layers no deeper than 2 feet avoiding inclined layers and inclined construction joints. The depth of layers shall be shallow enough so that the succeeding layer will be placed before the previous layer has attained its initial set. Concrete shall not be allowed nor shall it be caused to flow horizontally or on slopes in the form. Concrete placing on a slope shall begin at the lower end of the slope and progress upward.
4. Construction joints shall be made only where located on the plans or acceptable to the Engineer. Pours shall be planned to provide for the continuous placing of concrete from one construction joint to another. The face edges of all joints that are exposed to view shall be carefully finished true to line and elevation.
5. If depositing of concrete must be stopped short of a full placement, it shall be leveled to a horizontal plane or stopped against a vertical bulkhead. Such bulkhead or horizontal plane shall be located only as accepted by the Engineer.

E. Compaction:

1. All concrete shall be consolidated by vibration so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corners of forms,

eliminating all air pockets which may cause honeycombing, pitting, or planes of weakness. All compaction shall be done by use of high frequency internal vibrators. Where the vibrator cannot be inserted into the concrete, compaction shall be done by spading, rodding or forking.

2. Frequency of vibrator shall be not less than 7,000 impulses per minute. The Contractor shall provide a sufficient number of vibrators to properly consolidate all concrete immediately after placing. At least one standby vibrator shall be on hand at all times during placement of the concrete.
3. Vibration shall not be applied through contact with reinforcement or forms. Vibration shall penetrate previously deposited concrete sufficiently to prevent pockets or voids or construction joints from occurring between lifts, but must not be applied to concrete which has set up sufficiently to cease to be plastic under vibration.

F. Finishing:

1. Top surfaces of walkway surfaces shall receive a light broom finish, "sweat" finish, or other approved non-slip finish, as indicated or directed by the Engineer, and edged to provide rounded exposed corners. Radius of rounded edges shall be ¼" unless otherwise indicated.
2. Surface defects at formed surfaces shall be patched or repaired as specified in Paragraph 3.5. Fins shall be removed, corners and edges ground flush, and cement-wash finish applied to a uniform color and smooth texture.

### 3.5 REPAIR OF DEFECTS

- A. After forms have been removed, any concrete which is not constructed as shown on the plans or is out of alignment or level beyond required tolerances or which shows a defective surface which, in the opinion of the Engineer, cannot be properly repaired or patched shall be promptly removed and replaced.
- B. Where cast-in-place concrete exposed to view requires repairing or patching, the texture and color of the surface of such repair or patch shall closely match that of the surrounding surface.
- C. All tie holes and all repairable defective areas shall be patched immediately after form removal as follows:
  1. All honeycombed concrete shall be chipped out to sound concrete along neat lines, but in no case to a depth of less than 1 inch. If possible, edges of the chipped-out areas shall be slightly undercut.
  2. Rock pockets, form tie holes, deep holes not too large in area, other holes with relatively high ratio of depth to area, and similarly confined areas shall be dry packed.

After the area to be patched has been thoroughly cleaned and dampened, the mortar,

which shall consist of 1 part cement, 2-1/2 parts sand passing a #16 screen, and only enough water to produce a mortar that will stick together upon being molded into a ball by slight pressure of the hands, shall be placed in the holes in layers having a compacted thickness of about 3/8". Each such layer shall be solidly rammed over its entire surface using a hardwood stick and a hammer.

3. Shallow depressions where lateral restraint cannot be obtained, voids behind reinforcement, and holes extending through concrete sections shall be patched using a commercially prepared bonding agent and a stiff mortar mix of 1 part cement and not more than 2-1/2 parts sand.

For filling holes in exterior surfaces, an epoxy bonding agent shall be used. Application of the bonding agent shall be in strict conformance with the manufacturer's instructions.

4. An epoxy-and-sand mixture may be used in lieu of the mortar-and-bonding agent mixture for any of the patching above. The preparation of the surface to receive the patch, as well as the mixture proportions of the epoxy and sand, shall be in strict conformance with the manufacturer's instructions.
- D. Except for concrete required to be removed under paragraph 3.5 A, concrete which is not constructed as shown on the plans or is out of alignment and/or level beyond allowable tolerances may be patched or repaired as approved or directed by the Engineer.
  - E. Cracks in exposed concrete exceeding 0.002" wide shall be patched by veeing out the crack to a minimum width and depth of 1/4" and filling solid with epoxy mortar. Whenever necessary, the Engineer may require cracks be repaired by the epoxy injection method.
  - F. All costs associated with replacement of defective concrete and/or repair of defects shall be borne by the Contractor and at no additional cost to the State.

### 3.7 CURING AND PROTECTION:

- A. All concrete shall be initially cured for a period of not less than 7 days by one of the methods listed below. During this curing period, the concrete shall be maintained with minimal moisture loss at a relatively constant temperature. Fresh concrete shall be protected from heavy rains, flowing water, mechanical injury, and injurious action of the sun. Curing method selected shall be compatible with the finish to be applied. Curing shall immediately follow the finishing operation.
- B. Water Curing: If cured with water, concrete shall be kept wet by mechanical sprinklers, by ponding, or by any other method which will keep the surfaces continuously wet.
- C. Saturated Sand Curing: Surfaces cured with sand shall be covered with a minimum of 1-inch thickness of sand which shall be kept uniformly distributed and continuously saturated during the entire curing period.
- D. Curing Compounds: Curing compounds shall not be used on concrete surfaces that are to receive paint finish, acid stain, or other finishes unless manufacturer certifies that it is

compatible with the finish to be applied. Application of curing compound shall be in accordance with the manufacturer's instructions.

- E. Polyethylene Film: Opaque polyethylene film conforming to ASTM C171 may be used. The film shall be anchored securely and all edges sealed or applied in such a manner as to prevent moisture escaping from the concrete.

### 3.8 CLEANING:

Contractor shall clean up all concrete and cement materials, equipment and debris upon completion of any portion of the concrete work and upon completion of the entire concrete and related work.

END OF SECTION

## SECTION 05520

### ALUMINUM FABRICATIONS

#### PART 1 – GENERAL

##### 1.1 GENERAL REQUIREMENTS

This section covers furnishing and installing, complete in place, aluminum fabrications as shown on the drawings and as specified herein.

Provide all aluminum fabrications and related work, including but not limited to, the following:

1. Channel stringers, intermediate framing, cross bracing, clip angles, and connection plates.
2. All anchors, angles, bolts, and other accessories shown in details and/or required for the complete installation of the work.
3. Fabrication, welding, workmanship and material shall conform to the latest Edition of Aluminum Association's Aluminum Design Manual and Specification for Aluminum Structures.
4. All welding shall be done by qualified certified welders. Welders shall be certified by an approved Welding Test Laboratory who shall administer welding tests using procedures and qualification criteria similar to those of the American Welding Society for certifying welders for structural steel welding. Welder's Certifications shall be submitted to and approved by the Engineer prior to commencing fabrication.

##### 1.2 QUALITY ASSURANCE

- A. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible. Do not delay job progress; allow for trimming and fitting where taking field measurements before fabrication might delay work.
- B. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly, and to verify that prefabricated components fit properly. Prefabricate components and provide bolted connections wherever necessary in order to avoid field welding. Field welding shall not be permitted. Disassemble units to meet shipping and handling limitations. Clearly mark units for reassembly and installation.

##### 1.3 SUBMITTALS

The Contractor shall submit eight (8) sets of the following for approval:

- A. Material Certificates of Compliance.
- B. Mill Test Results.

- C. Welder's Certifications.
- D. Shop Drawings: Submit for review before fabrication. Detail all members and connections including those not specifically shown but which are required to complete work.

## PART 2 - MATERIALS

### 2.1 MATERIALS

- A. Aluminum Alloy, Shapes, Angles, and Plates: Aluminum alloy shall be 6005-T5 or 6061-T6, mill finished, manufactured by Indalex West, Inc. or approved equal.
- B. Aluminum Welding Filler Alloy: Shall be 5356.
- C. Bolts, Nuts, and Washers: Shall be Type 316 stainless steel conforming to ASTM A167. Bolts shall meet ASTM F593. Nuts shall meet ASTM F594. Lock washers shall be provided at aluminum-to-aluminum connections.
- D. Coating: Shop coat all aluminum members and shapes with one (1) coat of MicroGuard Tm AD95 as manufactured by ADSIL Corporation. Coating thickness and application methods shall be as recommended by the manufacturer. Coating application shall be done by certified applicators approved by ADSIL Corporation.

## PART 3 - EXECUTION

### 3.1 FABRICATION

- A. Workmanship:
  - 1. Use materials of size and thickness shown or, if not shown, of required size and thickness to produce strength and durability in finished product. Work to dimensions shown or accepted on shop drawings using proven details of fabrication and support. Use type of materials shown or specified for various components of work.
  - 2. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32" unless otherwise shown. Form bent-metal comers to smallest radius possible without causing grain separation or otherwise impairing work.
  - 3. Provide for anchorage of type shown, coordinated with supporting structure. Fabricate and space anchoring devices to provide adequate support for intended use.
  - 4. Cut, reinforce, drill and tap metal work as indicated or required to receive marine hardware and similar items.
  - 5. All exposed surfaces, comers, and edges shall be ground smooth and rounded. Welds shall be ground to a uniform appearance and smooth to touch.
- B. Shop Coating: Shop coat all aluminum surfaces with one (1) coat of MicroGuard Tm AD95 after fabrication. Coating thickness, preparation, and application shall be as recommended

by the manufacturer and applied by a certified applicator approved by ADSIL Corporation.

### 3.2 INSTALLATION

- A. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing aluminum fabrications to in-place construction; including anchor bolts, through-bolts, and other connectors. Locations of anchor bolts shall be adjusted to clear concrete reinforcement and other embedded items. Field drill holes in bearing plates, connection angles, etc. where anchoring to concrete for accurate location. Where holes are field drilled, cut edges and abraded parts shall be coated with one coat of MicroGuard Tm AD95 before installing bolts.
- B. Cutting, Fitting and Placement: Perform cutting, drilling, and fitting required for installation of aluminum fabrications and components. Set work accurately in location, alignment and elevation, plumb, level, true and free of rack, measured from established lines and levels.

3.3 MEASUREMENT AND PAYMENT: Aluminum fabrications will not be measured nor paid for directly, but shall be considered incidental to the various contract items in the Proposal Schedule.

END OF SECTION

## DIVISION 6 – WOOD AND PLASTICS

### SECTION 06100

#### ROUGH CARPENTRY

##### PART 1 - GENERAL

###### 1.1 DESCRIPTION OF WORK

This section covers the requirements for furnishing all labor, materials and equipment necessary to provide rough carpentry to construct redwood railings as shown on the plans and as specified herein.

###### 1.2 QUALITY ASSURANCE

- A. Experienced Workers: Provide sufficient experienced and skilled workers and supervisors who shall be thoroughly familiar with the type of construction involved and the materials and techniques required.
- B. Grading of Lumber: All lumber shall be grade stamped and graded in accordance with the Redwood Inspection Service (RIS) grading rules.

##### PART 2 - MATERIALS

###### 2.1 STRUCTURAL LUMBER

Structural lumber for railings shall be redwood meeting or exceeding the following grades:

- A. Railing posts and rails, 2x4 or larger: Select Structural.
- B. Railing pickets and cap: Clear Select Structural.

###### 2.3 HARDWARE

Connection hardware shall conform to the following:

- A. Bolts and Nuts: ANSI B18.2.1, ANSI B18.2.2 and ANSI B18.5. Use hot dip galvanized with galvanized hardware and stainless steel with stainless steel hardware. Use only Type 316 stainless steel bolts for connections to aluminum members. Through bolts shall be of appropriate length with full diameter plain shank and thread length of three diameters maximum to receive nut and washer. Bolt threads shall fully engage the nut with at least three, but not more than eight exposed threads when fully tightened. Cutting of bolt ends to meet this requirement will not be allowed.
- B. Nails: Common conforming to ASTM F1667. Use hot dip galvanized nails and spikes except when nails are used with stainless steel connectors in which case they shall be Type 316 stainless steel.

- C. Lag Bolts: ANSI B18.2.1, hot dip galvanized or Type 316 stainless steel, as appropriate.
- D. Wood Screws: ANSI B18.6.1, hot dip galvanized or Type 316 stainless steel.
- E. Sheet Metal Connectors: Use appropriate sheet metal connectors manufactured by Simpson Strong-Tie Company or approved equal as indicated.

## PART 3 - EXECUTION

### 3.1 WORKMANSHIP

- A. Pre-Inspection: Inspect lumber upon delivery to verify that all pieces meet the dimensional and appearance requirements for the work. Any lumber with excessive camber, warp, twist, crock, knots, mildew, fungus, mold, discoloration, or other defect shall be rejected and promptly replaced.
- B. Rough carpentry joints shall be true, tight, and well connected, with all members assembled in accordance with the plans and pertinent codes and regulations.
- C. Selection of Lumber Pieces: Carefully select members. Select individual pieces so that knots and obvious defects will not interfere with placing bolts, proper nailing or making connections.
- D. Cut out and discard defects that will render a piece incapable of serving its purpose when installed.
- E. Do not shim framing components.
- F. Drill holes for bolts square and in true alignment. Bolt holes shall be drilled 1/16" larger than the bolt diameter. Use templates as required to ensure that bolt holes are properly located.
- G. Provide a 30 lb. roofing felt barrier between wood and concrete or masonry.
- H. Round cut ends and other sharp edges. Sand to remove surface defects prior to painting. Refer to SECTION 09900 – PAINTING.

END OF SECTION

## SECTION 06520

### COMPOSITE AND PLASTIC LUMBER

#### PART 1 – GENERAL

##### 1.1 GENERAL

This section covers the furnishing and installation of composite and plastic lumber as shown on the plans and specified herein.

##### 1.2 SUBMITTALS

The Contractor shall submit eight (8) sets of the following for approval:

- A. Manufacturer's catalog data.
- B. Shop drawings depicting the sizes, layout and connection details to be used to secure the decking to structural framing.
- C. Certified test reports and certificates of compliance furnished by the manufacturer's testing laboratory or independent testing agency attesting that the product and related materials meet or exceed the requirements specified herein.
- D. Samples: Three (3) samples of typical deck and facing board showing full cross section and face finish shall be submitted for the color selection indicated. Should the physical sample be unacceptable, a different color may be selected from the color chart by the Engineer and samples of the new color selection shall be provided at no additional cost.

#### PART 2 – MATERIALS

##### 2.1 MATERIALS

- A. Fasteners shall be stainless steel conforming to ASTM A167, Type 316. Deck screws, No. 10 by 2½" minimum long, shall be used for decking, recessed at the finished surface. Machine bolts with flat washers shall be used for facing boards with counterbore to recess bolt heads flush.
- B. Composite and plastic lumber shall be of the dimensions called on the plans with slip resistant wood grained texture on all exposed surfaces (top and sides). All decking and facing boards shall be the same product and finish. Color shall be integral. Plastic lumber shall contain at least 50% post consumer recycled plastic. Ultraviolet light inhibitors shall be added to provide ultraviolet light (UV) stabilized. Acceptable products include:
  - 1. "Evolve", a 100% high density polyethylene (HDPE) plastic lumber product with wood grained texture manufactured out of a blend of pre-consumer, post-consumer (recycled) and virgin high density polyethylene, UV inhibitor, and integral colorant by Renew Plastics.

2. Approved equal. To be considered equal an alternative product shall be demonstrated by tests to have equal or better material properties to the following in addition to the above requirements. Composite lumber, if proposed for use, shall not contain organic material. Where there is a difference between the properties specified and the proposed alternative product, the alternative product shall be equal or better in all respects.

The following properties of “Evolve” plastic lumber are provided as the basis of acceptance of alternative composite and plastic lumber products. These properties are based upon third party test results furnished by the manufacturer. Tests were conducted on 1.5”x5.5” Evolve profile at various lengths in accordance with the ASTM test methods stated below:

	<u>Test Method</u>	<u>Value</u>
Specific Gravity	ASTM D6111	0.7064
Density	ASTM D6111	44.1 pcf
Water Absorption	ASTM D570	< 0.1
Compression - Secant Modulus	ASTM D6108	104,420 psi
Compression Stress at 3% Strain	ASTM D6108	1999 psi
Flexure – Secant Modulus	ASTM D6109	113,595 psi
Fastener Pullout Failure Load	ASTM D6117	1522 lbs
Fastener Shear Maximum Load	ASTM D6117	769 lbs
Coefficient of Friction – Embossed (Dry) Rubber	ASTM D2047	0.90
Coefficient of Friction – Embossed (Wet) Rubber	ASTM D2047	0.97
Thermal Expansion (Standard)	ASTM D6341	$4.965 \times 10^{-5}$ in/in/° F
Thermal Expansion (Decking)	ASTM D6341	$4.33 \times 10^{-5}$ in/in/° F
Flame Spread	ASTM E84	Class C

- C. Composite and plastic lumber shall be splinter free and have excellent traction even when wet. No stains, paint or sealants shall be required by the manufacturer to complete the installation.
- D. Initial color selection shall be as indicated on the plans, or if not indicated, shall be made by the Engineer from manufacturer's standard color charts. Color selection may be changed if based upon the samples it is determined that the color is unacceptable and an alternate color selection is required. Color selection shall be based upon additional color samples. Final color selection shall be approved by the Engineer prior to placing the order.

## PART 3 – EXECUTION

### 3.1 INSTALLATION

- A. Composite and plastic lumber shall be installed in accordance with manufacturer's instructions and recommendations. Decking and facing shall be cut square and smooth at the ends to uniform lengths. End cuts shall be smooth with exposed edges and corners slightly rounded. Trim and taper boards to make smooth transitions at abutments.
- B. Predrill and counterbore as recommended by the manufacturer, or as required to recess all fasteners flush with the exposed surface.
- C. Provide even gaps between boards as indicated on the plans, or if not otherwise indicated, as recommended by the manufacturer. Gaps shall be provided at ends of decking boards to take into account thermal expansion and contraction. Provide 1/8" gaps at ends of facing boards at end and butt joints.
- D. Plastic or composite lumber nailers shall be provided on structural supports. Nailers need not have wood grained finish and may be a different product compatible with the plastic lumber boards, but shall not contain organic (wood) filler. Predrill holes in true alignment for bolting with Type 316 stainless steel bolts with flat washers to structural framing. Counterbore to recess bolt heads flush with top of nailer. Adjust locations of deck board fasteners to clear nailer bolts.

END OF SECTION

## DIVISION 9 - FINISHES

### SECTION 09900

#### PAINTING

##### PART 1 - GENERAL

###### 1.1 DESCRIPTION OF WORK

This work shall consist of furnishing all labor, materials and equipment necessary for providing painting in accordance with the plans and as specified herein. Painting includes, but is not limited to, surface preparation and painting of new wood surfaces (railings).

###### 1.2 SUBMITTALS

Submit painting schedule, manufacturer's printed application instructions, surface preparation requirements, primer requirements, safety precautions, color brush outs, and certificates of compliance with applicable reference specifications for all paint materials to be used. Paint for existing surfaces shall be compatible with existing coatings. Color scheme shall be selected by the Engineer. Submit manufacturer's catalog data and application instructions for related materials.

##### PART 2 - MATERIALS

###### 2.1 PRODUCTS

###### A. Painting Schedule (general descriptions only):

1. For painting new concrete, plastic/composite lumber, aluminum framing, bolts and other hardware: None required.
2. For painting new wood framing (railings):  
2 Coats Transparent Oil Stain (Olympic Stain or approved equal)

B. All paints shall be asbestos-free, lead-free, zinc chromate-free, strontium chromate-free, and mercury-free. All paints shall be by a single manufacturer. All components of the paint system and related materials specified by the manufacturer shall be provided whether or not specified herein.

##### PART 3 - EXECUTION

###### 3.1 GENERAL

Properly prepare, prime and paint new surfaces per manufacturer's instructions and recommendations. Properly prepare and paint existing surfaces damaged, abraded,

discolored, or soiled such that the surface cannot be restored to preconstruction condition or better as a result of the Contractor's work or negligence. Repaint surfaces damaged by graffiti on a timely basis. No additional compensation will be made for restoration of vandalized surfaces.

Touch up paint shall closely match previously painted surfaces in color and finish. Wherever touch up painting would result in nonuniform or objectionable results, repaint entire surfaces. Extent of touch up or repainting required shall be at the sole discretion of the Engineer.

### 3.2 PROCEDURES

- A. Deliver material in original, unopened, factory containers. Properly store and protect materials prior to application.
- B. Surface preparation shall be in accordance with the paint manufacturer's instructions and recommendations. In general, remove all dust, dirt, oil, grease, loose or peeling paint, mortar and similar substances which prevent proper bonding. Caulk open joints where opaque paint is used. Putty and sand surfaces to even texture as required to obtain a uniform finish. Clean surfaces free from dust and debris before commencing with next coat.
- C. Protect adjacent surfaces from spills and drips. Brush apply stain. Brush or airless spray apply paints.
- D. Apply at the rates stated in the manufacturer's instructions. Thinning shall not be allowed unless specifically provided for by manufacturer's printed instructions.
- E. Coat all surfaces thoroughly. Leave no drips, spills, skips or holidays. Follow manufacturer's instructions regarding pot life and drying time. Protect surfaces until adequately dry.
- F. Follow manufacturer's instructions regarding safety precautions and clean up.

### 3.3 TOUCH-UP PAINT

Contractor shall turn over one unopened gallon of each type of finish paint or stain and application instructions to DOFAW for touch up purposes.

END OF SECTION