Land Division

DEPARTMENT OF LAND AND NATURAL RESOURCES

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

BOARD OF LAND AND NATURAL RESOURCES

Suzanne D. Case
Chairperson

CONTRACT SPECIFICATIONS AND PLANS

JOB NO. J42CK58B
Wailua Irrigation Ditch Improvements
Wailua, Kauai, Hawaii

Civil Engineer: Gannett Fleming

January 2020

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

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JOB NO. J42CK58B
Wailua Irrigation Ditch Improvements
Wailua, Kauai, Hawaii

Approved: Russell Tsuji

RUSSELL Y. TSUJI
Administrator
Land Division

Approved:

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

January 2020

NOTICE TO BIDDERS
(Chapter 103D, HRS)

COMPETITIVE BIDS for Job No. J42CK58B, Wailua Irrigation Ditch Improvements, Wailua, Kauai, 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.

The Department of Land and Natural Resources Interim General Condition, dated October 1994, as amended, and the General Conditions –AG008, latest revision shall be made part of the specifications.

The project is located at Wailua, Kauai, Hawaii.

The project involves the installation of 30" diameter reinforced concrete conveyance pipes along an existing open irrigation ditch, from the Wailua Reservoir outlet pipe to a culvert under Kuamoo Road and two concrete junction boxes at each end of the pipe system. Work also includes extending an existing guardrail along Kuamoo Road.

To be eligible to submit a bid, the Bidder must possess a valid State of Hawaii Contractor's license classification "A".

A voluntary State conducted pre-bid site inspection will be held on January 29 at 9:00 am. Please confirm your attendance through the HIePRO solicitation. Interested bidders will meet at the site (see plans). Entrance is along Kuamoo Road. Project site may have thick vegetation so dress appropriately.

The estimated cost of construction is $290,000.

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.

Since the estimated value of the cost of construction is more than $250,000, the apprenticeship agreement preference pursuant to Hawaii Revised Statutes §103-55.6 (ACT 17, SLH 2009) shall apply.

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. PROPOSALS**:** Bidders shall submit their bid, including the completed proposal form, bid bond, and any other documents required by the solicitation as part of their bid through the State of Hawaii e-Procurement System (HIePRO). See Item D, PROPOSAL FORM.

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 the 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 questionnaire. When requested by the State, 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 four lowest bidders until the successful bidder has entered into a contract and has furnished the required performance bond. All bid securities will be returned 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 HAWAII RESIDENTS: The Contractor shall comply with Act 68, SLH 2010, in the performance and for the duration of this contract. The Contractor shall ensure that Hawaii residents compose not less than eighty percent of the workforce employed to perform the contract work on the project. The eighty percent requirement shall be determined by

dividing the total number of hours worked on the contract by Hawaii residents, by the total number of hours worked on the contract by all employees of the Contractor in the performance of the contract. The hours worked by any Subcontractor of the Contractor shall count towards the calculation for this section. The hours worked by employees with shortage trades, as determined by the Department of Labor and Industrial Relations (DLIR), shall not be included in the calculation for this section.

The requirements shall apply to any subcontract of $50,000 or more in connection with the Contractor, that is, such Subcontractors must also ensure that Hawaii residents compose not less than eighty percent of the Subcontractor's workforce used to perform the subcontract.

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 for review and approval. After the Engineer approves the as-built drawings, the contractor shall submit an 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.

When indicated in the Proposal, the Contractor shall 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: When indicated in the Proposal, 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 $12.00 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.

P R O P O S A L

FOR

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION
State of Hawaii

JOB NO. J42CK58B
Wailua Irrigation Ditch Improvements
Wailua, Kauai, Hawaii

_____, 20__

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 construct the Wailua Irrigation Ditch Improvements, 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. J42CK58B
Wailua Irrigation Ditch Improvements
Wailua, Kauai, Hawaii

on file in the office of the Engineering Division for the TOTAL SUM BASE BID (Items 1 to 9) of:

_____

_____Dollars ($_____)

and will fully complete all work under this contract within 180 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
1.		LS	Erosion Control Measures, including site BMPs, in place complete.		$_____
2.		LS	30" Concrete Reinforced Pipes including collars, crushed rock, geotextile fabric, in place complete.		$_____
3.		LS	Upstream Junction Box at Dam Outlet, including grating, reinforcing, in place complete.		$_____
4.		LS	Downstream Junction Box at Kuamoo Road, including grating, reinforcing, in place complete.		$_____
5.		LS	Grouted Riprap Swale, in place complete.		$_____
6.		LS	Guardrail Transition in place complete.		$_____
7.		LS	Project Sign, in place complete		$_____
8.	Allowance		Field Office		$ 5,000.00
			Subtotal Base Bid (Items 1-8)		$_____
9.		LS	Mobilization and Demobilization (not to exceed 10% of the Subtotal Base Bid)		$_____
			Total Base Bid (Items 1-9)		$_____

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://spo.hawaii.gov/.*

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.	*[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.

DESCRIPTION	RECYCLED PRODUCT COST	NONRECYCLED PRODUCT COST
_____	$_____	$_____
_____	$_____	$_____
_____	$_____	$_____
_____	$_____	$_____

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

1. If applicable to this project, any bidder seeking the preference must be a party to an apprenticeship agreement registered with the State Department of Labor and Industrial Relations (DLIR) at the time the bid is submitted for each apprenticeable trade the bidder will employ to construct the project. "Employ" means the employment of a person in an employer-employee relationship.

    a. The apprenticeship agreement shall be registered with the DLIR and conform to the requirements of Hawaii Revised Statutes Chapter 372.

    b. Subcontractors do not have to be a party to an apprenticeship agreement for the bidder to obtain preference.

    c. The bidder is not required to have apprentices in its employ at the time the bid is submitted to qualify for the preference.

2. A bidder seeking the preference must state the apprenticeable trade the bidder will employ for each trade to be employed to perform the work by submitting a completed signed original *Certification Form 1* verifying participation in an apprenticeship program registered with DLIR. "Apprenticeable trade" shall have the same meaning as "apprenticeable occupation" pursuant to Hawaii Administrative Rules (HAR) §12-30-5.

    a. The *Certification Form 1* shall be authorized by an apprenticeship sponsor listed on the DLIR list of registered apprenticeship programs. "Sponsor" means an operator of an apprenticeship program and in whose name the program is approved and registered with the DLIR pursuant to HAR §12-30-1.

    b. The authorization shall be an original signature by an authorized official of the apprenticeship sponsor.

    c. The completed signed original *Certification Form 1* for each trade must be submitted with the bid. Previous certifications shall not apply.

    d. When filling out the *Certification Form 1*, the name of Apprenticeable Trade and Apprenticeship Sponsor must be the same as recorded in the List of Construction Trades in Registered Apprenticeship Programs that is posted on the DLIR website. "Registered apprenticeship program" means a construction trade program approved by the DLIR pursuant to HAR §12-301 and §12-30-4.

    e. The *Certificate Form 1* and the List of Construction Trades in Registered Apprenticeship Programs is available on the DLIR website at: http://hawaii.gov/labor/wdd.

3. Upon receiving the *Certification Form 1*, the Procurement Officer will verify that the apprenticeship program is on the List of Construction Trades in Registered Apprenticeship Programs and that the form is signed by an authorized official of the Apprenticeship Program Sponsor. If the programs and signature are not confirmed by the DLIR, the bidder will not qualify for the preference.

4. If the bidder is certified to participate in an apprenticeship program for each trade which will be employed by the bidder for the project, a preference will be applied to decrease the bidder's bid amount by five percent (5%) for evaluation purposes.

5. Should the bidder qualify for other preferences (e.g. Hawaii Products), all applicable preferences shall be applied to the bid price.

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 9) selected by the Board of Land and Natural Resources. Write the total of bid items 1 to 9 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 ninety (90) 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 HIePRO bid due date and time, 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 Fifty and NO/100 Dollars ($150.00) 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:

Addendum	Date Received	Addendum	Date Received
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 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's 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.

COMPLETE FIRM NAME OF JOINT CONTRACTOR OR SUBCONTRACTOR	NATURE AND SCOPE OF WORK TO BE PERFORMED

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 HIePRO website.

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. Proof of Insurance Coverage

A Certificate of Insurance or other documentary evidence, to the satisfaction of the Engineer, that the Contractor has in place all insurance coverage required by the contract. The Certificate of Insurance shall contain wording which identifies the Project number and Project title for which the certificate of insurance is issued. Refer to the following for insurance requirements:

1. Insurance Requirements

(a) Obligation of Contractor - Contractor shall not commence any work until it obtains, at its own expense, all required herein 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 laws of the State to issue such insurance in the State of Hawaii. Coverage by a "Non-Admitted" carrier is permissible provided the carrier has a AM Best's Rating of "A-VII" or better.

(b) 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.

(c) Certificate(s) of Insurance acceptable to the Department shall be filed with the Engineer prior to commencement of the work. Certificates shall identify if the insurance company is a "captive" insurance company or a "Non-Admitted" carrier to the State of Hawaii. The Best's Rating must be stated for the "Non-Admitted" carrier. Certificates shall contain a provision

that coverages afforded under the policies will not be canceled or changed until at least thirty (30) 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.

(d) 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.

(e) All insurance described herein shall be primary and 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.

(f) 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.

(g) If the Contractor is self-insured, it shall furnish, upon the request and the satisfaction of the Engineer, any documentation to demonstrate the ability to self-insure itself. The Engineer, from time to time, can conduct an audit to determine the ability of the Contractor to be self-insured. Failure to comply with the Engineer's request will be considered a material breach of the contract, and at the discretion of the Engineer, may be sufficient grounds to terminate the contract, suspend any work or withhold future payments.

(h) It is the responsibility of the Contractor to notify the Department of any changes to its insurance policies or if the Contractor receives a notice of cancellation of any of its insurance policies. The Contractor will immediately provide written notice to the Department should the insurance policies evidenced on its Certificate of Insurance form be cancelled, limited in scope, or not renewed upon expiration.

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 worker's compensation insurance for all persons whom they employ or may employ in carrying out the work under this contact. 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. The Contractor shall obtain General Liability insurance with a limit of not less than $1,000,000 per occurrence and $2,000,000 aggregate. The insurance policy shall contain the following clauses: 1) "The State of Hawaii is added as an additional insured as respects to operations performed for the State of Hawaii."; and 2) "It is agreed that any insurance maintained by the State of Hawaii will apply in excess of, and not contributed with, insurance provided by this policy." The required limit of insurance may be provided by a single policy or with a combination of primary and excess polices."

(c) Comprehensive Automobile Liability. The Contractor shall obtain Auto Liability insurance covering all owned, non-owned and hired autos with a combined single Limit of not less than $1,000,000 per accident for bodily injury and property damage. The insurance policy shall contain the following clauses: 1) "The State of Hawaii is added as an additional insured as respects to operations performed for the State of Hawaii."; and 2) "It is agreed that any insurance maintained by the State of Hawaii will apply in excess of, and not contributed with, insurance provided by this policy." The required limit of insurance may be provided by a single policy or with a combination of primary and excess polices.

Furthermore, the Contractor's commercial general liability insurance and automobile liability insurance 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 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.

(d) 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 insurance policy shall contain the following clauses: 1) "The State of Hawaii is added as an additional insured as respects to operations performed for the State of Hawaii."; and 2) "It is agreed that any insurance maintained by the State of Hawaii will apply in excess of, and not contributed with, insurance provided by this policy." The required limit of insurance may be provided by a single policy or with a combination of primary and excess polices.

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.

TECHNICAL SPECIFICATIONS

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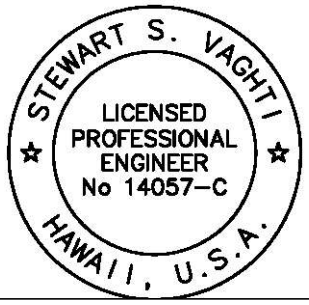

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION.

Digitally signed by Stewart S. Vaghti
DN: cn=Stewart S. Vaghti, o=Gannett Fleming, Inc., ou, email=svaghti@gfnet.com, c=US
Date: 2020.01.10 08:35:40 -07'00'

Signature
Expiration Date of the License: April 30, 2020

SECTION 01 10 00

ARCHAEOLOGICAL PROTECTION

PART 1 GENERAL

1.01 SUMMARY

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

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 CONSTRUCTION METHOD:

A. 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 01 33 00

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: General procedures and requirements for submittals and substitutions.

B. The following is an initial (but not necessarily complete) list of anticipated submittals (not including pay applications and other Contract and General Conditions related documents):
   1. Permits, permit closeout documents, and related correspondence.
   2. Construction staging plan.
   3. Temporary Irrigation Line Plan and Details
   4. BMP Product Data
   5. Erosion Control Plan Updates (if any).
   6. Construction schedule and weekly construction schedule updates (as needed).
   7. Contractor safety plan (including the emergency action plan as a separate section).
   8. Traffic Control Plan and related product data.
   9. Daily construction reports.
   10. Reinforced concrete pipe.
   11. Concrete Forming and Accessories Product Data
   12. Reinforcing shop drawings (for junction boxes and pipe collars).
   13. Junction box grate and frame.
   14. Expansion joint material and waterstop product information.
   15. Pipe bedding material including geotextile.
   16. Concrete mix design information.
   17. Concrete test reports.
   18. Grouted riprap and product data.
   19. Guardrail inspector qualifications.
   20. Guardrail installation contractor’s qualifications.
   21. Catalog data for the guardrail, posts, block out and end anchor.
   22. Guardrail installation drawings and instructions.
   23. Guardrail FHWA Acceptance Letters.
   24. If used, fill material laboratory moisture density test results (ASTM d968).
   25. If used, fill material in-place field density test results (ASTM d1556 or d6938).
   26. Hydroseed material (seeds, fertilizer and mulch) and equipment (as needed).
   27. Record documents (as-built drawings).
   28. Manufacturer’s operations and maintenance manual (if any).
   29. Warranties.

C. Related Sections:
   1. Contract Documents and General Conditions
   2. Technical Specification Sections

1.02 DEFINITIONS

A. The term shop drawing and submittals used throughout this Section and the CONTRACT DOCUMENTS includes manufacturer's product data, shop drawings, samples and certificates.
   1. Product Data: Manufacturer's descriptive literature, product specifications, performance and capacity rating schedules, published details, and installation instructions.
   2. Shop Drawings: CONTRACTOR or manufacturer prepared, completely dimensioned and annotated detail drawings of the products presented.
   3. Samples: CONTRACTOR or manufacturer prepared and delivered physical samples as requested in the various Specifications Sections.
   4. Certificates: CONTRACTOR or manufacturer prepared written instruments certifying product compliance with the CONTRACT DOCUMENTS. The written instruments shall include test records or reports, and such other types of certificates as required by the Specifications.

1.03 SUBMISSIONS

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

B. Submit to the STATE for review, one electronic copy (Shop Drawings) of required submittal items. Submit hard copies at the request of the STATE or ENGINEER. ENGINEER/STATE will return reviewed submissions. Provide additional copies of prints from reproducibles, material lists or catalog cuts if needed for distribution to suppliers or subcontractors.

C. Submittals shall be processed and delivered electronically except for the following:
   1. Samples and color selections shall be delivered by mail or courier to the STATE and ENGINEER. Make submissions to the mailing address of the STATE.
   2. Final hard copies of O&M Manuals shall be delivered by mail or courier. Review copies shall be submitted electronically.

D. After review by the STATE and/or ENGINEER shop drawings will be returned marked as follows: Reviewed; Furnish as Corrected; Revise and Resubmit; or Rejected.
   1. Reviewed: When shop drawings are returned “Reviewed”, it is understood that the shop drawings have been found to be in conformance with the CONTRACT DOCUMENTS. The ENGINEER's review of the shop drawings does not relieve the CONTRACTOR from responsibility for errors or discrepancies in such shop drawings.
   2. Furnish as Corrected: When shop drawings are returned “Furnish as Corrected”, it is understood that the shop drawings have been found to be in conformance with the CONTRACT DOCUMENTS, provided the changes noted by the ENGINEER are incorporated in the shop drawings. Shop drawings returned “Furnish as Corrected” will not require resubmission.

3. Revise and Resubmit: When shop drawings are returned noted "Revise and Resubmit", it is understood that the CONTRACTOR shall make the required corrections and resubmit corrected Shop Drawings to the STATE in accordance with the CONTRACT DOCUMENTS. Fabrication, ordering of materials, and/or performing work associated with the "Revise and Resubmit" submittal is not authorized, and doing so is at the CONTRACTOR's expense and risk.
4. Rejected: When shop drawings are returned "Rejected", the submittal does not meet the requirements of the CONTRACT DOCUMENTS, and it is understood that the CONTRACTOR shall make completely new shop drawings and submit in accordance with the CONTRACT DOCUMENTS. Fabrication, ordering of materials, and/or performing work associated with the "Rejected" submittal is not authorized, and doing so is at the CONTRACTOR's expense and risk.

E. The CONTRACTOR shall have a rubber (or electronic) stamp made up in the following format:

CONTRACTOR NAME

PROJECT: _____
LOCATION: _____
JOB NO: _____

CERTIFICATION STATEMENT: By this submittal, I hereby represent that I have determined and verified field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data and I have checked and coordinated each item with contract drawings, specifications, other applicable approved shop drawings and contract requirements. All affected contractors and suppliers are aware of and will integrate this submittal into their own work.

DATE: _____

SUBMITTAL NO: _____
SUBMITTAL NAME: _____
SPECIFICATION SECTION: _____
SPECIFICATION PARAGRAPH: _____
DRAWING NUMBER: _____
SUBCONTRACTOR NAME: _____
SUPPLIER NAME: _____
MANUFACTURER NAME: _____

CERTIFIED BY: _____

F. 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 their receipt, review, and log stamp and for any comments that relate to the sample.

1. Data: Provide following identification data, as applicable, contained or permanently adhered to submittals for approval.
   a. Project: **Wailua Irrigation Ditch Improvements**
   b. Location: **Wailua, Kauai, HI**
   c. Job No.: **J42CK58B**
   d. CONTRACTOR's certification statement.
   e. Date.
   f. Submittal No.: Number each Shop Drawing using Specification Section numbers followed by 1.0, 2.0, 3.0, etc. for each submittal within a Section. Resubmittals must include .1, .2, .3, etc. in addition. For example, if the fifth item submitted in Section 03 30 00 is returned for correction three times, the next resubmittal number will be 03 30 00-5.3.
   g. Submittal Name.
   h. As applicable, specification section and corresponding paragraph, drawing number, subcontractor name, supplier name and manufacturer name.
   i. Certified By: Name of CONTRACTOR individual certifying the submittal.

G. No portion of work requiring a submittal, shop drawing, working drawing, sample, or catalog data is allowed to be started nor materials be ordered, purchased, fabricated or installed prior to an accepted “Review” or “Furnish as Corrected” of the respective submittal. Fabrication performed, materials purchased or on-site construction accomplished that does not conform to approved Shop Drawings and data is at CONTRACTOR's risk. The STATE and/or ENGINEER will not be liable for expense or delay due to corrections or remedies required to accomplish conformity.

H. Shop drawings shall be submitted in sufficient time to allow the ENGINEER not less than twenty regular working days for examining the submittal.

I. The shop 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.

J. Unless otherwise approved by the ENGINEER, shop drawings shall be submitted only by the CONTRACTR, 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.

K. When the shop drawings have been reviewed by the ENGINEER, an electronic copy (or two sets of hard copy submittals) will be returned to the CONTRACTOR appropriately stamped. If major changes or corrections are necessary, the shop

drawing may be rejected and returned to the CONTRACTOR with such changes or corrections indicated, and the CONTRACTOR shall correct and resubmit electronically (or eight hard copies if requested), 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.

L. 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 ENGINER accepted 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, they shall state in his letter whether or not such deviations involve any deduction or extra cost adjustment.

M. The "Review" of the above drawings, lists, prints, specifications, or other data shall in no way release the CONTRACTOR from their 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.

1.04 RECORD DRAWINGS

A. CONTRACTOR shall maintain a duplicate full size set of field posted records ("as-builts") drawings at the job site. Clearly and accurately record all deviations from alignments, elevations, and dimensions, which are stimulated on this drawing for approved changes that deviate from the drawings.

B. CONTARCTOR shall record changes immediately after they are constructed in place and where applicable. Refer to the authorizing document (field order, change order, or contract modification). Use red pencil to record changes. Make field posted records drawings available to the construction engineer at any time so that the clarity and accuracy can be monitored.
   1. Give particular attention to information concealed elements that cannot be readily identified and recorded later.
   2. Accurately record information in an understandable drawing technique.
   3. Record data as soon as possible after obtaining it. Record and check the markup before enclosing concealed installations.
   4. Make the contract drawing or the shop drawings, whichever is most capable of showing actual physical conditions, completely and accurately. Where shop drawings are marked, show cross reference on contract documents.
   5. Mark important additional information that was either shown schematically or omitted from original drawings.

6. Locate concealed structures or utilities by dimension from benchmarks or permanent structures. Locate site utilities by dimensions, azimuth and lengths from benchmarks or permanent structures.
7. Note field order numbers, change order numbers, contract modification numbers, alternate numbers, post-construction drawing numbers (PCD) and similar identification (e.g. RFI numbers) where applicable.

C. CONTRACTOR shall use the final updated contract drawing set plus applicable shop drawings for making the final field posted record drawing submittal.

D. CONTRACTOR shall certify drawing accuracy and completeness. Label and sign the title sheet and on al sheets in the margin space to the right of the sheet number, written from the bottom upward, with the title "field posted record drawings" and certification information as shown below. Provide a signature line and company name line for each subcontractor that will also certify the respective drawing. Adjust size to fit margin space.

FIELD POSTED CERTIFIED BY:_____ DATE: _____

RECORD DRAWINGS [CONTRACTOR'S COMPANY NAME]

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Requirements for providing, operating, and removing the following temporary facilities and controls:
      a. Construction staging.
      b. Temporary security measures.
      c. Temporary irrigation delivery.
      d. Protection of the Work and property.

B. Related Sections:
   1. Contract Documents and General Conditions
   2. Section 01 33 00 – Submittal Procedures
   3. Section 01 55 26 – Traffic Control
   4. Section 01 57 00 – Temporary Pollution Control
   5. Section 02 01 00 – Maintenance of Existing Conditions

1.02 REFERENCES

A. Abbreviations and Acronyms:
   1. ADA: Americans with Disabilities Act.
   2. DLNR: Department of Land and Natural Resources.

B. Reference Standards:
   1. The Associated General Contractors of America (AGC of America):
      a. Manual of Accident Prevention for Construction.
   2. Hawaii Department of Transportation (HDOT):
      a. HDOT 2005 Standard Specifications.
   3. U. S. Government:
      a. Occupational Safety and Health Administration (OSHA):
         1) 29 CFR 1910 Occupational Health and Safety Standards.
         2) 29 CFR 1926 Safety and Health Regulations for Construction.

1.01 COORDINATION

A. In performing the Work, it may be necessary for the CONTRACTOR in cooperation with the STATE to provide temporary access, or other facilities or services at no increase in the Contract Price.

B. Notification of Property Owners and Utilities:
   1. At least 2-days in advanced of work that may affect property and utility owners, properly notify them of this work.

C. Dam Operation Warning Information:
   1. Obtain dam operation warning information from the STATE and dam operators by coordinating with the appropriate party on a regular and timely basis.

D. Traffic Coordination:
   1. During the Contract, coordinate the routing of vehicular and pedestrian traffic with the STATE that may be impacted by the Project. See also Section 01 55 26 – Traffic Control.

E. Permits:
   1. As necessary, obtain the local permits necessary to allow the legal execution of the Work, and comply with permit requirements
   2. Pay fines and related costs resulting from failing to comply with the permit requirements and violating the permits' rules, regulations, and programs at no increase in the Contract Price.

1.02 SUBMITTALS

A. Submit the following to the STATE for approval in accordance with the requirements of Section 01 33 00, Submittal Procedures:
   1. Construction Staging Layouts.
      a. Prepare a construction staging and layout plan identifying locations, dimensions, and access.
   2. Traffic Control Plan (see Section 01 55 26 – Traffic Control).
   3. Temporary Irrigation Line Plan and Details.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:
   1. Before starting construction operations, review the Site to observe pertinent conditions relative to the Contract, including the status of rights-of-way, structures, and obstructions and other objects to be removed, altered, or changed.
   2. Inspect the work performed by others upon which the proper execution or results of the Work of this Contract depend, if any; and promptly report delays, defects, or deficiencies in the other work that render it unavailable or unsuitable for the proper execution and results of the Work of this Contract to the STATE in writing.

3.02 PREPARATION

A. Protection of In-Place Conditions:
   1. Security and Public Safety:
      a. Provide temporary security to protect the Work and existing facilities from unauthorized entry, vandalism, and theft.

1) Where required for security, provide temporary chain link fences.

b. Take the precautions necessary to prevent injury to the public and damage to the property of others.
   1) Before commencing operations, furnish and erect construction fencing, walls and barricades to safeguard the public against accident or damage resulting from the CONTRACTOR's operations and as required to prevent unauthorized access to the Work and to the storage areas.
      a) Maintain these safeguards, and only remove them when they are no longer required to protect the public and the property of others.

c. Provide temporary barriers and enclosures that prevent unauthorized entry to construction areas, and that protect existing facilities and adjacent properties from damage from construction operations.

d. Perform work, stage construction, and provide measures to protect existing structures, utilities, and in-place conditions from damage during construction. Repair or replace damaged structures, utilities and in-place conditions as required.

3.03 REPAIR / RESTORATION

A. Repair damage caused by the installation or use of temporary work.

3.04 MAINTENANCE

A. Maintain the temporary facilities in a proper, safe, sanitary and operating condition for the duration of the Contract or of their use.

B. Frequently clean up refuse, rubbish, scrap materials, and debris caused by operations so that the Site presents a neat, orderly, and workmanlike appearance.

C. Make arrangements to legally dispose of the refuse, rubbish, scrap materials, and debris caused by operations offsite.

D. Maintain irrigation supply to downstream users.
   1. It is the intent of the CONTRACT DOCUMENTS to complete all work on the Wailua irrigation ditch improvements while maintaining a continuous flow of water to the downstream users of the irrigation supply ditch. The CONTRACTOR is required to schedule all work accordingly with the STATE and Ditch Operator (if any) and shall not disrupt flow to downstream users unless coordinated with the STATE and Ditch Operator and documented in writing in advanced.
   2. Temporary irrigation water delivery and/or bypass is the responsibility of the CONTRACTOR and shall be included in the contract price.
   3. The CONTRACTOR shall submit a Temporary Irrigation Bypass Plan including details and product information for review and approval in accordance with Specification Section 01 33 00, Submittal Procedures.
   4. Do not start irrigation ditch dry-up until the temporary irrigation bypass plan is approved and DLNR provides authorization to proceed.

5. See also article 1.07A in Specification Section 02 01 00, Maintenance of Existing Conditions, for temporary irrigation delivery requirements.
6. A separate weir construction project must be complete before drying up the existing irrigation ditch or authorization is received from DLNR to proceed.

3.05 CLOSEOUT ACTIVITIES

A. Upon completion of the Contract, remove the temporary facilities and controls from the Site.

END OF SECTION

SECTION 01 50 50

MOBILIZATION AND DEMOBILIZATION

PART 1 GENERAL

1.01 SUMMARY:

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

1.02 GENERAL REQUIREMENTS

A. 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.

B. 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

3.01 GUIDELINES:

A. 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.

B. 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.

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

END OF SECTION

SECTION 01 55 26

TRAFFIC CONTROL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Section covers requirements for traffic control during construction of the PROJECT.

B. Related Sections:
   1. Contract Documents and General Conditions
   2. Technical Specification Sections

1.02 REFERENCES

A. The following is a list of standards which may be referenced in this section:
   1. AASHTO Guide for the Design of Bicycle Facilities, Current Edition.
   2. AASHTO Roadside Design Guide, Current Edition.
   3. American Traffic Safety Services Association (ATSSA).
   4. Hawaii Department of Transportation (HDOT), Standard Specifications, Current Edition.
   5. Federal Highway Administration. Standard Highway Signs.
   6. NCHRP – Report 350 Recommended Procedures for the Safety Performance Evaluation of Highway Features.
   7. U.S. Department of Transportation, Federal Highway Administration (USDOT): Manual of Uniform Traffic Control Devices (MUTCD).
   8. U.S. Department of Transportation, Federal Highway Administration: Design Guidance: Accommodating Bicycle and Pedestrian Travel: A Recommended Approach.

1.03 SUBMITTALS

A. Submit the following to the STATE for approval in accordance with the requirements of Section 01 33 00, Submittal Procedures:
   1. Traffic Control Plan developed by CONTRACTOR.
      a. Submit the initial phase Traffic Control Plan at the preconstruction conference. Submit plans for future phases of construction a minimum of 28 days before start of that construction phase to allow review and resubmittal, if necessary, and public notification. Meet with the STATE, Local Jurisdictions, and other affected agencies having jurisdiction to review the Traffic Control Plans for each phase of construction. Do not begin construction on any given phase before receiving written acceptance.
      b. Failure to submit the Traffic Control Plans within the specified time frames will not be justification for additional working days. Failure to adequately address comments in any required resubmittal also will not justify additional working days.

2. Administrative Submittals: Copies of permits, licenses, and approvals for construction as required by Laws and Regulations and governing agencies.
   a. CONTRACTOR shall be responsible for securing any necessary permits or approvals related to Traffic Control activities. Application for permits and governing agency approvals shall only be made after acceptance of plan by STATE.
3. Product Data: Warning signs and barricades.

1.04 VEHICULAR TRAFFIC

A. The Traffic Control Plan provided in the DRAWINGS and SPECIFICATIONS shall be used by CONTRACTOR as guideline only. The CONTRACTOR shall be responsible for the development and implementation of the Traffic Control Plan.

B. CONTRACTOR shall submit a Traffic Control Plan for approval by STATE in accordance with the submittal requirements defined in these SPECIFICATIONS. Adjustments to the approved plan may be required by STATE based on actual traffic operations. Changes to the plan shall only be made with the written approval of the STATE.

PART 2 PRODUCTS

2.01 SAFETY DEVICES AND SYSTEMS

A. CONTRACTOR shall use devices and systems which meet NCHRP-350 Report crash test requirements as defined by the Federal Highway Administration unless exceptions are granted by the STATE.

2.02 TRAFFIC CONTROL SIGNING AND DEVICES

A. Signs: Comply with the requirements of the Traffic Control Plan, other requirements defined in this section and any applicable requirements defined in the reference documents, including HDOT Standard Specifications.

B. Channelizing Devices:
   1. Comply with the requirements of the Traffic Control Plan, other requirements defined in this section and any applicable requirements defined in the reference documents, including HDOT Standard Specifications.
   2. Use construction orange tubular markers and cones during daylight hours only.

C. Barricades:
   1. Comply with the requirements of the Traffic Control Plan, other requirements defined in this section and any applicable requirements defined in the reference documents, including HDOT Standard Specifications.
   2. Do not use rocks, asphalt, or concrete pieces, construction materials, and other debris as weighting devices for barricades. Sand bags will be permitted as long as a low center of gravity is maintained as approved.

PART 3 EXECUTION

3.01 VEHICULAR TRAFFIC

A. CONTRACTOR shall:
   1. Conform to the USDOT MUTCD or applicable statutory requirements of authority having jurisdiction and the accepted Traffic Control Plan.
   2. Allow emergency vehicles immediate passage.
   3. Recognize that Local Government requirements take precedence over the MUTCD. Operations on or about traffic areas and provisions for regulating traffic shall additionally be subject to the regulation of other governmental agencies having jurisdiction over the affected areas.
   4. Keep traffic areas free of excavated material, construction equipment, pipe, and other materials and equipment.
   5. Keep fire hydrants and water control valves free from obstruction and available for use at all times.
   6. Conduct operations in a manner to avoid unnecessary interference with public and private roads and drives and provide and maintain temporary access for businesses and residences. Provide and maintain suitable and safe bridges, detours, or other temporary expedients for accommodation of public and private travel. When access to private driveways must be temporarily denied due to construction operations, notify the property owner or responsible party of such closure not less than 24 hours in advance of closure. Give notification in writing and include the estimated duration of the closure.
   7. Minimum lane width shall be 10 feet, unless noted otherwise. Where cones are used to separate traffic lane from construction zone, do not use traffic lane for accessing construction zone, and do not store materials or equipment on or near shoulder of traffic lane side of roadway.
   8. In making street crossings, do not block more than one-half the street at a time. Maintain one lane of traffic at all times. Ensure access for traffic in both directions.
   9. Notify the fire department, police/sheriff department, highway patrol, ambulance service, local school district, and transit 14 days before closing roadway or portion thereof. Notify said departments or agencies when streets are again passable for vehicles. Conduct operations with the least interference to fire equipment access, and at no time prevent such access. Furnish CONTRACTOR's night emergency telephone numbers to the police or sheriff's department.
   10. Pedestrian and bicycle access along streets will be kept open and safe from construction activities and traffic lanes.

B. Flaggers: May be required to provide for public safety or the regulation of traffic, or by jurisdictional authorities; and if used, shall be properly equipped and certified by ATSSA.

3.02 PROTECTION OF WORK AND PROPERTY

A. Warning Signs and Barricades:

1. Provide warning signs and barricades for the following:
   a. Open trenches and other excavations.
   b. Obstructions, such as material piles, equipment (moving or parked), and piled embankment.
   c. Protection of roads and driveways.
2. Warning signs and barricades shall be illuminated by means of warning lights from sunset to sunrise.

3.03 PARKING

A. CONTRACTOR, with the approval of STATE, shall designate parking areas for the use of all construction workers and others performing WORK or furnishing services in connection with the PROJECT so as avoid interference with public traffic, STATE's operations, or construction activities.

3.04 ROADWAY USAGE BETWEEN OPERATIONS

A. At all times when WORK is not actually in progress, CONTRACTOR shall make passable and shall open to traffic such portions of the PROJECT and temporary roadways or portions thereof as may be agreed upon between CONTRACTOR and STATE and all authorities having jurisdiction over any properties involved.

END OF SECTION

SECTION 01 57 00

TEMPORARY POLLUTION CONTROLS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Temporary pollution controls.

B. Related Sections
   1. Contract Documents and General Conditions
   2. Section 01 50 00: Temporary Facilities and Controls
   3. Section 31 25 00: Erosion and Sediment Controls

1.02 SUBMITTALS

A. Submit documentation as required to the STATE in accordance with the requirements of Section 01 33 00, Submittal Procedures:
   1. NPDES Construction General Permit. The CONTRACTOR is responsible for obtaining a Construction General Permit (if necessary) for the project.
      a. NPDES Notice of Termination (NOT) if necessary.
   2. Noise Permit. The CONTRACTOR is responsible for obtaining a Noise Permit (if necessary) for the project.

1.03 REFERENCES

A. US Environmental Protection Agency, Interim Guidance, A Guide for Construction Sites. EPA 833-R-060-04, January 2007.

B. Hawaii State Department of Health, Administrative Rules, Title 11, Chapter 46 - Community Noise Control.

C. Hawaii State Department of Health, Administrative Rules, Title 11, Chapter 60 – Air Pollution Control.

D. Hawaii County Code, Chapter 10, Erosion and Sedimentation Control.

1.04 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. Enclosed chutes and/or containers shall be used for conveying debris from above to ground floor level.
5. 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 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. 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. Pile driving operations shall be confined to the period between 9:00 a.m. and 5:30 p.m., Monday through Friday. Pile driving will not be permitted on weekends and legal State and Federal holidays.
4. Starting-up of construction equipment meeting allowable noise limits shall not be done prior to 7:00 a.m. without prior approval of the STATE. Equipment exceeding allowable noise levels shall not be started-up prior to 7:00 a.m.

D. Erosion and Sediment Control
1. See also Erosions Control Plans. Modifications to this plan are the responsibility of the CONTRACTOR at no additional cost to STATE.
2. See Section 31 25 00 – Erosion and Sediment Control.
3. Install sediment and erosion controls prior to work involving site clearing, stripping and stockpiling topsoil, excavation, and earthwork.
4. Maintain and repair sediment and erosion controls during course of construction.
5. During interim grading operations, the grade shall be maintained so as to preclude any damage to adjoining property from water and eroding soil.
6. 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 additional cost to the STATE.

7. Drainage outlets and silting basing shall be constructed and maintained as shown on the plans to minimize erosion and pollution of waterways during construction.
8. Silt barriers include hay bales, silt fences, fiber rolls, and other similar temporary soil sediment barriers for the purpose of intercepting and detaining sediment from disturbed areas during construction. Firmly anchor silt barriers into the ground.
9. Silt Fences - Fabric and posts suitable for sedimentation control application. Silt fence fabric shall be UV protected. Silt fences shall be constructed in accordance with the details shown on the Drawings.
10. All erosion control facilities will be the property of CONTRACTOR, and shall be removed and disposed of offsite after all Work is complete.

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 State Department of Transportation. 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.

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.

PART 2 PRODUCTS (NOT USED)

A. See Specification Section 31 25 00 for Erosion and Sediment Control product information.

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 02 01 00

MAINTENANCE OF EXISTING CONDITIONS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for maintenance of existing facilities and adjacent properties during construction. In general, the extent of disturbance on the project property should be limited to the extent possible to those areas identified as requiring modification, per the DRAWINGS. Work is as indicated and annotated on the DRAWINGS and includes maintaining access to and operation of the Wailua Dam by the dam operators and State dam safety officials; and temporary irrigation bypass facilities.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements: Sequence work at various locations on or around the dam in accordance with the requirements for construction as shown on the DRAWINGS and discussed in the SPECIFICATIONS. Work shall be sequenced to limit disruption of water flow in the irrigation ditch and storage of water in the reservoir, per the requirements listed below.

1.03 MAINTENANCE OF PROJECT/SITE CONDITIONS

A. The on-site construction window for the project shall be limited to a maximum of 30 consecutive calendar days unless otherwise approved by the STATE.

B. Wailua Reservoir and Dam: The CONTRACTOR does not have the option of draining the reservoir.

C. It is imperative that the CONTRACTOR exercise extreme care and diligence when conducting all phases of onsite construction operations and particularly when excavating near the existing ditch and ditch embankment.

D. Existing CMP Culvert and Headwalls: The CONTRACTOR is required to conduct work at site in such a manner as to protect the existing CMP culvert and headwalls under the roadway and prevent contamination of water in the ditch.

E. Irrigation Ditch (See Specification Section 01 50 00 Temporary Facilities and Controls): It is the intent of the CONTRACT DOCUMENTS to complete all work on the Wailua irrigation ditch improvements while maintaining a continuous flow of water to the downstream users of the ditch. The CONTRACTOR is required to schedule all work accordingly with the State and Ditch Operator (if any) and shall not disrupt flow to downstream users unless coordinated with the Ditch Operator and documented in writing in advanced. Temporary irrigation water delivery and/or

bypass is the responsibility of the CONTRACTOR and shall be included in the contract price. ~~Ditch operators contact information is provided below.~~

~~OPERATOR: LES MILNES~~

~~OFFICE : 808-241-4064 CELL: 808-639-0152~~

F. Sequence of Construction: Construction activities shall be sequenced and executed in a manner to minimize and/or manage potential risks associated with the Work. To ensure that adequate planning is undertaken to accomplish this objective, the following conditions must be satisfied:
   1. Excavation – Excavation shall be sequenced and conducted in such manner that will minimize and manage potential risks associated with the Work. This includes no excavation to the Wailua Dam embankment outside of the immediate work area for the concrete boxes.
   2. Demolition – Schedule demolition/removal of the guardrail with the respective stages of planned construction activities to limit safety hazards and the duration that temporary diversion facilities must remain active to protect work in progress.
   3. Schedule – The CONTRACTOR shall submit a construction schedule and sequencing plan to the STATE before beginning the Work.

G. The locations of site access and staging areas are identified on the DRAWINGS. Permits and approvals have been issued as required based upon this information and in the event CONTRACTOR proposes any changes, it will be the CONTRACTOR'S responsibility to secure any necessary approvals from regulatory agencies, at the CONTRACTOR'S expense.

H. Construction traffic shall be prohibited from driving directly over the downstream embankment toe-drain, dam embankment slope, spillway, v-ditch, or any other dam infrastructure not designated as a road, staging area or work area.

I. The CONTRACTOR must provide and allow access to the dam and all dam facilities to the dam operators, owners and State dam safety officials.

J. No work, staging or operations shall disrupt or impede the safe operation of Wailua dam. This includes, but is not limited to:
   1. No work or staging within the auxiliary spillway.
   2. No work or staging shall disrupt the operation or use of any dam operational equipment, such as gates, piezometers, toe drains, structural monitoring points, benchmarks, staff gauges, signage, etc.

K. Damage to any dam facilities shall be repaired to the STATE'S satisfaction at the CONTRACTOR'S expense.

1.04 MAINTAIN ADEQUATE ENVIRONMENTAL CONTROLS:

A. Site Flooding: The CONTRACTOR is advised that all work shall be protected against damage from flood stages. Work damaged by such causes shall be repaired or replaced to the STATE's satisfaction at the CONTRACTOR'S expense.

B. The CONTRACTOR shall conduct his operations to protect any natural resources that are not within the construction footprint and not indiscriminately destroy or disturb habitat or species. The CONTRACTOR shall install Construction Barriers to protect areas not planned to be disturbed by construction activities and implement other requirements as referenced on the DRAWINGS.

C. The CONTRACTOR shall be required to install, monitor, operate and maintain all Erosion and Sedimentation Control Features in accordance with Specification Section 31 25 00, Erosion and Sediment Control, and the approved Erosion and Sediment Control Plan on the DRAWINGS.

D. To the maximum extent possible, wooded areas shall be protected by the CONTRACTOR during construction. If there are wooded areas where the CONTRACTOR believes clearing would facilitate construction, the CONTRACTOR shall obtain permission of the STATE prior to any clearing operation beyond the limits of clearing shown on the DRAWINGS. No extra payment will be made for such additional clearing.

1.05 MAINTENANCE, USE, AND REPAIRS TO LOCAL ROADS:

A. The CONTRACTOR shall be responsible during the term of the Contract for the prompt and efficient removal, to the satisfaction of the STATE and the owners of State, County, and/or Local roads, of any soil or other debris deposited on roads or adjacent areas as a result of the CONTRACTOR'S activities associated with the Work. Any potholes, ruts or other damage to existing State, County, and/or Local road and adjacent areas, which are created by the CONTRACTOR'S activities, shall be immediately repaired to the satisfaction of the owner of the road, using procedures and materials approved by the owner of the road.

B. If the CONTRACTOR fails to repair or clean a road surface and adjacent areas in a timely manner or fails to repair or clean the road surface and adjacent areas to the satisfaction of the owner of the road, the owner of the road or the STATE has the right to perform the corrective work and charge the CONTRACTOR for the cost incurred. If the CONTRACTOR fails to pay the charges, said charges will be deducted by the STATE from the Contract Price.

1.06 OPERATION OF EXISTING VALVES AND SLUICE GATES:

A. Under no circumstances shall the CONTRACTOR'S personnel operate valves or sluice gates in the STATE'S system. The CONTRACTOR shall notify the STATE a minimum of seven (7) working days in advance of when specific valves or sluice gates are required to be operated, and the STATE'S personnel shall operate the same.

B. Under no circumstances shall the CONTRACTOR'S personnel operate valves or sluice gates in the irrigation system. The CONTRACTOR shall notify the STATE a minimum of seven (7) working days in advance of when specific valves or sluice gates are required to be operated, and the STATE will coordinate with the ~~East Kauai Irrigation System~~ operator.

1.07 ADDITIONAL REQUIREMENTS:

A. Temporary Irrigation Delivery: Unless agreed upon (in writing) with the Ditch Operator, the CONTRACTOR shall provide for temporary irrigation service from the reservoir to the existing irrigation ditch downstream of the work area: The temporary irrigation delivery shall include at minimum:
   1. A control valve located adjacent to the dam access road.
   2. A minimum flow rate of 1,000 GPM and a maximum flow rate of 2,000 GPM available with the operation of the control valve.
   3. Screening at the intake.
   4. Adequate protection of the pipe from construction and maintenance traffic.
   5. Sufficient restraining of the pipe, tapping sleeve and valve(s)

   The CONTRACTOR shall make provisions for the installation, operation, maintenance and removal of infrastructure necessary to provide the irrigation water, included in the contract price.

B. Site Access: The CONTRACTOR shall limit his access and egress to and from Project sites to use of existing access roads demarcated on the Location and Site Maps shown on the Cover of the DRAWINGS. If modifications to the existing access gate are desired such modifications shall be the responsibility of the CONTRACTOR. The CONTRACTOR assumes responsibility to lock access gate when his forces are not on site at no additional cost to the STATE.

C. The CONTRACTOR shall not trespass, store material or equipment or in any other manner occupy any property outside of the construction work area, right-of-ways or easements referenced in these SPECIFICATIONS or shown on the DRAWINGS, without written permission of the STATE and respective property owner(s). Any damage done by the CONTRACTOR to property outside of authorized work areas shall be restored immediately to the property owner's satisfaction at the CONTRACTOR'S expense.

D. Surplus Materials Disposition: CONTRACTOR shall remove from the site and dispose, in a lawful manner, any surplus material including all rubbish, waste and refuse resulting from the work. The site and adjacent premises shall be restored to a condition satisfactory to the STATE. During the progress of the Work, the area shall be maintained clean and clear of debris and waste material. It shall be the responsibility of the CONTRACTOR to locate a satisfactory landfill area for offsite disposal of waste and refuse materials.

E. Ordering Materials: The CONTRACTOR shall submit shop drawings to the STATE within 30 days after the NOTICE TO PROCEED and verify all sizes, dimensions and quantities before ordering materials. Any ordering of materials in advance of the "Reviewed" shop drawings or submittals is at the contractor's risk.

F. Subcontracts: The CONTRACTOR shall, at the request of the STATE, furnish fully executed copies of agreements between the CONTRACTOR and any Subcontractor.

G. Work Schedule and Daily Reports: The CONTRACTOR shall keep the STATE informed of his planned work activities by regularly updating and submitting work schedules, covering minimum periods of 1 week. Schedules shall be submitted at least two days before the weekly period begins. Inspection forces will be scheduled according to the CONTRACTOR'S schedules. Work will not be permitted if the inspection force has not been fully informed at least 7 days in advance of intended work.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

SECTION 03 10 00

CONCRETE FORMING AND ACCESSORIES

PART 1 GENERAL

1.01 SUMMARY

A. This Section covers the concrete formwork for construction of all concrete structures set forth on the DRAWINGS and in these SPECIFICATIONS.

B. Related Sections:
   1. Section 01 33 00 – Submittal Procedures
   2. Section 03 20 00 – Concrete Reinforcing
   3. Section 03 30 00 – Cast-in-Place Concrete

1.02 REFERENCES:

A. American Concrete Institute:
   1. ACI 347 - Guide to Formwork for Concrete.
   2. ACI 350R - Environmental Engineering Concrete Structures.

B. U.S. Department of Commerce Product Standards:
   1. PS-1-74 - Construction and Industrial Plywood.
   2. PS-20-70 - American Softwood Lumber.

C. Western Wood Products Association: WWPA Catalog "A" Product Use Manual.

D. American Plywood Association: APA Grade - Trademarks.

E. Southern Pine Inspection Bureau: Standard Grading Rules for Southern Pine.

1.03 SUBMITTALS

A. Submit documentation as required to the ENGINEER in accordance with the requirements of Section 01 33 00, Submittal Procedures:
   1. Form Coating: Submit manufacturer's descriptive product data and current specification covering named product, include certification that material is acceptable for use in structures processing or storing potable water.
   2. Form Ties: Submit manufacturer's descriptive product data, current specification covering named product, and two samples.

1.04 QUALITY ASSURANCE

A. Formwork Design: Provide formwork designed to ensure the tolerances indicated and to include factors pertinent to safety of personnel during construction.
   1. Design formwork in accordance with American Concrete Institute's Guide to Formwork for Concrete, ACI 347, and in accordance with the following:

a. Design forms and falsework to include assumed values of live load, dead load, weight of moving equipment operated on formwork, temporary construction material, foundation pressures, stresses, lateral stability, and such other factors pertinent to safety of structure during construction.
b. Design formwork to be readily removable without impact, shock, or damage to cast-in-place concrete surfaces and adjacent construction.

B. Allowable Tolerances: Set and maintain concrete forms within tolerance limits stated in American Concrete Institute's Guide to Formwork for Concrete, ACI 347.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Storage and Protection:
1. Protect formwork materials before, during, and after erection to ensure acceptable finished concrete work. Also protect in-place materials and work of other trades in connection with concrete work.
2. In event of damage to erected forms, make necessary repairs or replacements prior to concrete pours. Perform such corrective work at no increase in Contract Price.

PART 2 PRODUCTS

2.01 MATERIALS

A. Lumber:
1. Form framing, sheathing, struts, braces and shoring in conformance with WWPA Catalog A or SPIB Grading Rules.
2. Rough Structural and Dimension Lumber: Provide lumber of allowable species, surfaced four sides as applicable, and grade stamped with the appropriate WWPA or SPIB stamp indicating product compliance with PS-20-70.
3. Use lumber free of material defects that would deform the finished concrete product.

B. Plywood:
1. Form Sheathing and Panels: Not less than 5/8 inch thick Exterior Type B-B Plywood Class I and II EXT-APA conforming to U.S. Product Standard PS-1-74.
2. Use Class II only on surfaces not exposed to view.

C. Steel:
1. Metal Forms of a pre-engineered standard design, conforming to the concrete sections indicated on the DRAWINGS, may be used in lieu of wood forms.

D. Form Ties:
1. Provide factory-fabricated, adjustable-length, removable or snap-off metal form ties conforming to ACI 347 and ACI 350R.
2. Use snap-off metal ties with ends that break at least 1½ inches from the face of the wall.
3. Do not use removable ties that leave holes larger than one (1) inch.

4. In construction of liquid-retaining structures and structures designed to exclude groundwater, use ties that are designed to prevent seepage or flow of water along the embedded item.
5. Do not use removable type form ties in construction of liquid-retaining concrete structures.
6. Do not use wire ties, flat bands or form ties fabricated on the project site.
7. Do not use wood spacers.

E. Form Coatings: Provide commercial formulation form-coating compounds that will not bond with, stain, nor affect concrete surfaces, and will not impair subsequent treatment of concrete surfaces requiring bond or adhesion, nor impede the wetting of surfaces to be cured with water or curing compounds. On surfaces which will be in contact with potable water, use no material which will add taste, odor, or toxic effects to the water.

PART 3 EXECUTION

3.01 INSPECTION

A. Prior to placement of concrete, inspect forms for cleanliness and accuracy of alignment.

3.02 PREPARATION

A. Apply form coatings in accordance with manufacturer's specifications.

B. Do not allow excess form coating material to accumulate in the forms.

C. Do not allow form coatings to come in contact with construction joints and reinforcing steel.

3.03 ERECTION

A. General: Construct forms in accordance with ACI 347 to required dimensions, plumb, straight, mortar tight, and paste tight where appearance is important.
1. Securely brace and shore forms to prevent displacement, bowing and pillowing, and to safely support imposed concrete load.
2. Provide offsets, keyways, recesses, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and such other features as required. Use selected materials to obtain above requirements.
3. Fabricate forms for easy removal without hammering or prying against concrete surfaces.
4. Form intersecting planes to provide true, clean-cut corners with edge grain of plywood not exposed to concrete.
5. Build into forms, or otherwise secure in forms, items such as inserts, anchors, miscellaneous metal items, and such other embedded items as indicated on DRAWINGS.

6. Wet forms sufficiently to prevent joints in wood forms from opening prior to concrete pour.
7. Do not use stay-in-place metal forms.

B. Openings: Provide temporary openings where interior area of formwork is inaccessible for cleanout, for inspection before concrete placement, and for placement of concrete.
   1. Securely brace temporary openings and set tightly to forms to prevent the loss of concrete mortar. Locate temporary openings on forms in as inconspicuous a location as possible consistent with the requirements of the work.
   2. Provide openings in concrete formwork of the correct size and in the proper location to accommodate other items and operations of construction work passing through forms. Accurately place and securely support items to be built into forms.

C. Earth Forms: Earth forms are not permitted.

3.04 CONSTRUCTION

A. Form Removal
   1. Remove forms in accordance with ACI 347 without damage to concrete and in a manner to ensure complete safety and serviceability of the structure.
      a. Do not cut form ties back from the face of the concrete.
      b. Concrete surface shall not contain residual form coating that will interfere with other materials or coatings to be applied.
   2. Do not remove supporting forms or shoring until the members have acquired sufficient strength to safely support their weight and the anticipated construction loads without distortion or excessive deflection. The ENGINEER's consent to remove forms does not relieve the CONTRACTOR of the responsibility for the safety of the work.
   3. When the atmospheric temperature at the site has been continuously above 50 degrees F. from the time of the pour, the forms shall be removed at the earliest practical time within the limits set forth in this paragraph, and wet curing shall continue without delay.
      a. Forms for walls and other vertical faces may be carefully removed 24 hours after the last portion of concrete in the section involved has been placed, provided the concrete has sufficiently hardened to preclude damage resulting from form removal, and provided these members are not subjected to loads for a period of 14 days.
      b. Maintain horizontal forms in place for a minimum of 14 days or until the concrete, as determined by job-cured cylinders, has attained a compressive strength of 2,000 psi.
      c. Carefully remove forms for columns before the falsework is removed from beneath the beams or girders.
      d. When a water-reducing retarder is used in the concrete mix, the normal time periods for removing forms may need to be increased.

4. When the atmospheric temperature at the site drops below 50 degrees F., leave all forms in place for at least 5 days regardless of the temperature within the protective covering or enclosure.
5. Upon removal of forms, notify the ENGINEER in order that a review of the newly stripped surfaces may be made before patching.

3.05 RE-USE OF FORMS

A. Forms for re-use shall meet new form requirements with respect to effect on poured concrete appearance and structural stability.

B. Do not delay or change the concrete pour schedule as a result of reusing forms compared to the schedule obtainable if all forms were new (in the case of wood forms) or if the total required forms were available (in the case of metal forms).

END OF SECTION

SECTION 03 20 00
CONCRETE REINFORCING

PART 1 GENERAL

1.01 SUMMARY

A. The work specified in this Section consists of furnishing and installing reinforcement for concrete structures.

B. Related Sections:
   1. Section 01 33 00 – Submittal Procedures
   2. Section 03 10 00 – Concrete Forming and Accessories
   3. Section 03 30 00 – Cast-in-Place Concrete

1.02 REFERENCES

A. American Concrete Institute:
   1. ACI 315 - Details and Detailing of Concrete Reinforcement.
   2. ACI 318-02 - Building Code Requirements for Reinforced Concrete.

B. American Society for Testing and Materials:
   1. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
   2. ASTM A706 - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement.
   3. ASTM A1064 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete

C. Concrete Reinforcing Steel Institute:
   1. Manual of Standard Practice for Reinforcing Concrete Construction.

D. HDOT 2005 Standard Specifications for Road and Bridge Construction, as amended.

1.03 SUBMITTALS

A. Submit documentation as required to the STATE in accordance with the requirements of Section 01 33 00, Submittal Procedures:
   1. Shop Drawings and Product Data:
      a. Prepare shop drawings of concrete reinforcement in accordance with American Concrete Institute's ACI 315.
      b. Provide drawings showing all fabrication dimensions and locations for placing reinforcement and bar supports; indicate bending diagrams, splicing, and lap of rods, shapes, dimensions, and details of bar reinforcing and accessories.
   2. Test Reports:

a. Submit copies of reports showing the results of tests, conducted in accordance with the American Society for Testing and Materials Specifications.
b. Test Requirements may be waived based upon certified copies of mill test reports.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Storage of Materials:
1. Store reinforcing materials in a manner to prevent excessive rusting and fouling with dirt, grease, and other bond-breaking coatings.
2. Identify bundles of reinforcing steel with tags wired to steel.

1.05 PROJECT CONDITIONS

A. Protection: Protect in-place reinforcement from excessive construction traffic and other work.

PART 2 PRODUCTS

2.01 MATERIALS

A. Reinforcing Steel:
1. Reinforcement Bars: ASTM A706 (per HDOT Standard Specification) or ASTM A615, Grade 60, deformed steel, which shall satisfy the exceptions in ACI Building Code, AASHTO, and Federal Specifications.
2. Wire: ASTM A1064.
3. Metal Accessories: CRSI Manual of Standard Practice for Reinforcing Concrete Construction.

B. Rebar Splicing Coupler: A two-piece splicing system manufactured from ASTM A706 or A615 Grade 60 deformed rebar. A dowel bar splicer with integral nailing flange shall be threaded for a threaded down-in rebar such that the completed splice exceeds the tensile requirements of ACI 318.
1. Internal Coupler Protector: Provide coupler manufacturer's plastic internal coupler protector where couplers are provided for anticipated future additions.
2. Bar End Protectors: Plastic solid sleeve for placement over bar ends to protect threading from damage, contamination, and rust.
3. Use Rebar Splicing Coupler only where shown on DRAWINGS or where approved by the ENGINEER.
4. Acceptable Manufacturers:
a. Richmond Screw Anchor Co.
b. Dayton Superior.
c. Or approved equal.

2.02 FABRICATION

A. General: Fabricate reinforcement to the dimensions indicated on the DRAWINGS and within the tolerances given in ACI 315. Perform bending of steel reinforcement by the cold bending method.
   1. Do not use bars with kinks or bends not indicated on DRAWINGS.
   2. Perform bar shape fabrication in a manner that will not injure the material or lessen the member strength.
   3. Use a designed bending machine, either hand- or power-operated.
   4. Do not field bend bars partially embedded in concrete unless approved by the ENGINEER.

PART 3 EXECUTION

3.01 INSPECTION

A. Notify the STATE 48 hours before placing concrete so the placement of metal reinforcement can be inspected.

3.02 INSTALLATION

A. Placing:
   1. Place metal reinforcement accurately and securely brace against displacement within permitted tolerances and in accordance with ACI 318 through the use of reinforcing accessories.
   2. Terminate reinforcement two inches from face of expansion joints.
   3. Continue reinforcement across or through construction joints.
   4. When obstructions interfere with the placement of reinforcement, pass such obstructions by placing reinforcing around it. Do not bend the reinforcing to clear the obstructions.
   5. Install welded wire fabric as indicated, lapping joints eight inches and wiring securely. Extend welded wire fabric to within two inches of sides and ends of slabs.
   6. Do not lay metal reinforcement on formwork.
   7. Place slab reinforcement supported from the ground on concrete blocks of the correct height and having a compressive strength equal to or greater than the specified compressive strength of the concrete that is being placed. Use concrete blocks not larger than 3 inches by 3 inches with a height equal to required bottom steel cover.
   8. Reinforcement supported from formwork for slabs and beams not exposed to weather or to a continuous wet environment may use bar chairs made of plastic or metal. Use stainless steel boosters in areas exposed to a wet environment.
   9. Place additional reinforcement around openings in slabs and walls as detailed on the DRAWINGS.

B. Splicing:

1. Splice metal reinforcement as indicated on the DRAWINGS and in accordance with ACI 318.
2. Welding of crossing bars (tack welding) is not permitted.
3. Secure metal reinforcement at intersections with not less than No. 16-gauge annealed wire or appropriate size clips. When bar spacing is less than 12 inches, tie alternate intersections.
4. Make mechanical butt splices in accordance with rebar splicing coupler manufacturer's installation instructions.

C. Cleaning: Clean or otherwise protect metal reinforcement so that at the time concrete is placed, reinforcement is free from rust, scale or other coatings that will destroy or reduce bond.

D. Concrete Reinforcement Protection: Provide protection for reinforcement during concrete pours in accordance with ACI 318, unless indicated otherwise on the DRAWINGS.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY

A. The work specified in this Section consists of designing mix, furnishing, placing, and curing Portland Cement concrete, reinforced and unreinforced, as indicated.

B. Classes of Concrete:
   1. Class "A" concrete (3,000 psi at 28 days) shall be placed for the following:
      a. Junction Boxes.
   2. Class “B” concrete (2,500 psi at 28 days) shall be placed for the following:
      a. Concrete Pipe Collar.

C. Related Sections
   1. Section 01 33 00 – Submittal Procedures
   2. Section 03 10 00 - Concrete Forming and Accessories.
   3. Section 03 20 00 - Concrete Reinforcing.
   4. Work Specified Under Other Sections: Items to be embedded in concrete are as specified in the various Sections of this Contract Specification. The responsibility for coordinating concrete pours with embedded items rests solely with the CONTRACTOR.

1.02 REFERENCES

A. American Association of State Highway and Transportation Officials:
   1. AASHTO M 182 - Burlap cloth made from Jute or Kenaf.

B. American Concrete Institute:
   1. ACI 117 - Standard Specifications for Tolerances for Concrete Construction and Materials.
   2. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete.
   3. ACI 211.2 - Standard Practices for Selecting Proportions for Structural Lightweight Concrete.
   4. ACI 213R - Guide for Lightweight Aggregate Concrete.
   5. ACI 301 - Specifications for Structural Concrete for Buildings.
   6. ACI 304R - Guide for Measuring; Mixing, Transporting and Placing Concrete.
   7. ACI 305R - Hot Weather Concreting.
   8. ACI 308 - Standard Practice for Curing Concrete.
   9. ACI 318 - Building Code Requirements for Reinforced Concrete.
   10. ACI 350R - Environmental Engineering Concrete Structures.

C. American Society for Testing and Materials:

1. ASTM C 31 - Methods of Making and Curing Concrete Test Specimens in the Field.
2. ASTM C 33 - Specification for Concrete Aggregates.
3. ASTM C 39 - Test Method for Compressive Strength of Cylindrical Concrete Specimens.
4. ASTM C 94 - Specification for Ready-Mixed Concrete.
5. ASTM C 143 - Test Method for Slump of Portland Cement Concrete.
6. ASTM C 150 - Specification for Portland Cement.
7. ASTM C 156 - Test Method for Water Retention By Concrete Curing Materials.
8. ASTM C 171 - Specification for Sheet Materials for Curing Concrete.
9. ASTM C 172 - Methods of Sampling Freshly Mixed Concrete.
10. ASTM C 192 - Method of Making and Curing Concrete Test Specimens in the Laboratory.
11. ASTM C 231 - Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
12. ASTM C 260 - Specification for Air-Entraining Admixtures for Concrete.
13. ASTM C 309 - Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
14. ASTM C 387 - Standard Specification for Packaged, Dry, Combined Materials for Concrete and High Strength Mortar.
15. ASTM C 494 - Specification for Chemical Admixtures for Concrete.
16. ASTM D 695 - Test Method for Compressive Properties of Rigid Plastics.
17. ASTM D 1751 - Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types).
18. ASTM D 1752 - Specification for Preformed Sponge Rubber and Cork Expansion Joint Fillers for Concrete Paving and Structural Construction.
19. ASTM C989 - Standard Specification for ground granulated blast-furnace slag for use in concrete and mortars.

D. U.S. Army Corps of Engineers Specifications:
   1. CRD-C 572 - Specification for Waterstop.

E. Federal Specifications:
   1. Fed. Spec. TT-C-800A - Curing Compound, Concrete, for New and Existing Structures.

F. Hawaii Department of Transportation (HDOT) 2005 Standard Specifications for Road and Bridge Construction:
   1. Section 601 – Structural Concrete
   2. Section 602 – Reinforcing Steel

1.03 SUBMITTALS

A. Submit the following to the STATE for approval in accordance with the requirements of Section 01 33 00, Submittal Procedures:
   1. Product Data:

a. Submit manufacturer's descriptive product data and current specifications for the concrete accessories specified herein (admixtures, curing materials, etc.). Include manufacturer's installation/application instructions.

2. Design Mix for each concrete mixture:
   For offsite batched concrete, include mix design information and laboratory trial batch results or certification of compressive strength from a series of a minimum of 30 consecutive tests made within the previous 12 months.=
   a. For onsite batching (i.e. ready-to-use concrete mix), submit manufacturer's product information, including bag sizes, technical data, compressive strength, and mixing and installation instructions.
3. Certificates:
   a. For offsite batched concrete, submit certificates originated by the batch mixing plant certifying ready mixed concrete, as manufactured and delivered, to be in conformance with ASTM C 94.
4. Delivery Tickets:
   a. For offsite batched concrete, a delivery ticket shall accompany each load of concrete from the batch plant.
   b. Tickets must be signed by the CONTRACTOR'S representative, noted as to time and place of pour, and kept in a record at the site. Make such records available for inspection upon request by the ENGINEER.
   c. Information presented on the ticket to include the tabulation covered by ASTM C 94, Section 16, as well as any additional information the local codes may require.
5. Portable Concrete Mixer (Optional):
   a. If concrete will be mixed on-site, submit portable concrete mixer equipment information.
6. Schedule:
   a. Submit schedule showing methods, construction joint locations, and sequence of pouring a minimum of 10 days prior to placing concrete.

1.04 PROJECT CONDITIONS

A. ACI Compliance: Cast-in-place concrete work shall conform to ACI 301 except as modified by these SPECIFICATIONS or the DRAWINGS.

1.05 SEQUENCING

A. Where other construction work is relative to concrete pours, or must be supported by or embedded in concrete, those performing such related work must be given five days' notice to introduce or furnish embedded items before concrete is placed.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store admixtures in a manner to prevent contamination, evaporation, moisture penetration, or damage. Do not use products which have been stored longer than 6 months.

PART 2 PRODUCTS

2.01 MATERIALS

A. Cementitious Material:
   1. Portland Cement: ASTM C 150 Type II, Moderate Sulfate Resistance.
      a. Only one brand and manufacturer of approved cement shall be used for exposed concrete.
   2. Fly Ash: ASTM C 618, Class F, except as follows:
      a. Loss on ignition shall not exceed 4 percent.
      b. Sulphur trioxide content shall not exceed 4 percent.

B. Normal-Weight Aggregates:
   1. ASTM C 33, graded, 1-1/2-inch nominal maximum coarse-aggregate size.
   2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

C. Water:
   1. ASTM C 1602 and potable.
   2. Clean and free from injurious amounts of oils, acids, alkalis, salts, organic materials, or other substances that may be deleterious to concrete or reinforcement.

D. Chemical Admixtures (Required):
   1. Crystalline waterproofing additive.
   2. Crystalline type that chemically controls and permanently fixes a non-soluble crystalline structure throughout the capillary voids of the concrete. The system shall cause the concrete to become sealed against the penetration of liquids from any direction and shall protect the concrete from deterioration due to harsh environmental conditions.
   3. Dosage rate to be 2% of the total cementitious material content.
   4. Acceptable Manufacturers:
      a. Xypex C-2000/C-2000 NF.
      b. Or Approved Equal.

E. Concrete Admixtures (Optional):
   1. Use only non-corrosive, non-chloride admixtures.
   2. Provide admixtures produced and serviced by established, reputable manufacturers and use in compliance with manufacturer's recommendations.
   3. Certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete
   4. Not permitted are admixture conforming to ASTM C494, Types C or E.
   5. Water-Reducing Admixture: ASTM C 494, Type A.
      a. Acceptable Manufacturers:
         1) Eucon WR-75; The Euclid Chemical Company.
         2) Pozzolith 220N; Master Builders.
         3) Plastocrete 161; Sika Corporation.

4) Or approved equal.

6. Retarding Admixture: ASTM C 494, Type B.
7. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
   a. Acceptable Manufacturers:
      1) Eucon Retarder-75; The Euclid Chemical Company.
      2) Pozzolith 100XR; Master Builders.
      3) Plastiment; Sika Corporation.
      4) Or approved equal.
8. High-Range, Water-Reducing Admixture: ASTM C 494, Type F.
9. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494, Type G.
10. Plasticizing and Retarding Admixture: ASTM C 1017, Type II.

F. Curing Materials:
   1. Use curing materials that will not stain or affect concrete finish or lessen the concrete strength and comply with the following requirements:
   2. Burlap: Materials conforming to AASHTO M 182.
   3. Sheet Materials: Material conforming to ASTM C 171.
   4. Membrane-Forming Curing and Sealing Compound: ASTM C 1315, Type 1, Class A.
      a. Clear, Solvent-Borne,
      b. For concrete indicated to be sealed, curing compound shall be compatible with sealer.

2.02 MIXES

A. Selection of Proportions of Normal weight Concrete: ACI 211.1.

B. Proportions of Ingredients:
   1. Establish proportions, including water ratio on the basis of either laboratory trial mixture tests or standard deviation analysis, with the materials specified herein.
   2. Laboratory Trial Mixture Test: ACI 301, Section 4 and ACI 318, Section 5.3.
   3. Standard Deviation Analysis: ACI 301, Section 4 and ACI 318, Section 5.3.
   4. If pre-packaged dry combined concrete materials are used: ASTM C 387

C. Water-Cementitious Material Ratio:
   1. Class A Concrete shall have a maximum water- cementitious material ratio of 0.55.
   2. Class B Concrete shall have a maximum water- cementitious material ratio of 0.62.
   3. The quantity of water to be used in the determination of the water/cementitious materials ratio shall include free water on aggregates in excess of SSD (saturated surface dry) and the water portion of admixtures.

D. Slump: Proportion and produce concrete to a slump as indicated below. The slump ranges apply when vibration is used to consolidate the concrete.

	Slump, in.	
Types of Construction	Maximum[1]	Minimum
Misc. reinforced structures	4	1

1. May be increased 1 in. for methods of consolidation other than vibration.
2. Pumped concrete shall have a 5-inch maximum slump, measured prior to pumping.

2.03 SOURCE QUALITY CONTROL

A. Classes of Concrete:
   1. Class A: 3,000 psi minimum compressive strength at 28 days; 560 pounds per cubic yard minimum cementitious material content; 0.55 maximum water-cement ratio (lb/lb). Per HDOT Standard Specifications.
   2. Class B: 2,500 psi minimum compressive strength at 28 days; 500 pounds per cubic yard minimum cementitious material content; 0.62 maximum water-cement ratio (lb/lb). Per HDOT Standard Specifications.

PART 3 EXECUTION

3.01 INSPECTION

A. Inspect work to receive cast-in-place concrete for deficiencies which would prevent proper execution of the finished work. Do not proceed with placing until such deficiencies are corrected to the satisfaction of the ENGINEER.

3.02 PREPARATION

A. Joints:
   1. Bonding to New Concrete: Bond fresh concrete with hardened previously poured new concrete in accordance with the following:
      a. Roughen and clean hardened concrete of foreign matter and laitance and dampen with water.
      b. Cover the hardened concrete with a heavy coating of grout to approximately ½-inch thickness. Use grout of same material composition and proportions of concrete being poured except coarse aggregate omitted. Use grout with a slump of 6 inches minimum.
      c. Place new concrete on grout before it has attained its initial set.
      d. Other bonding methods must be approved by ENGINEER prior to use.
   2. When concreting is to be discontinued for more than forty-five (45) minutes and if the construction plane is to be horizontal, install keyways, waterstops and embed dowels in the concrete before initial hardening. Use keyways and dowels in vertical concrete construction only when indicated or directed by the ENGINEER. Use waterstops for water retaining structures or structures below grade. Horizontal joints are not permitted in slabs or footings.

a. Extend dowels placed in joint one splice length into wall and one splice length into next concrete pour.

3.03 CONSTRUCTION

A. Production of Concrete
   1. Ready-Mixed Concrete:
      a. Batched, mixed and transported in accordance with ASTM C94.
      b. Add admixtures to the mix in accordance with ACI 301.
      c. Plant equipment and facilities conforming to the "Check List for Certification of Ready Mixed Concrete Production Facilities" of the National Ready Mixed Concrete Association.
   2. On-Site Concrete Mixing (Optional):
      a. On-site mixing must be pre-approved by the ENGINEER.
      b. Single batch mixing capacity shall be sufficient for single uninterrupted pours. Do not exceed the mixing quantity of the equipment.
      c. Equipment shall be in good working order, clean of debris and remnant/foreign materials.
      d. CONTRACTOR shall accurately measure and record mix design proportions of each product prior to each batch.
      e. Measure solid materials by weight and liquid or paste materials by weight or volume.
      f. Mix all materials in a mechanical mixer.
      g. Add/mix dry ingredients first followed by wet ingredients.
      h. Mix sufficiently to produce a uniform mixture to the required consistency.

B. Placing
   1. General: Conduct placement work in accordance with ACI 304R and such additional requirements as specified herein.
      a. Complete discharge of the concrete within 1 ½ hours or before the mixing drum has revolved 300 revolutions, whichever comes first, after the introduction of the mixing water to the cement and aggregates or the introduction of the cement to the aggregates.
   2. Preparation:
      a. Prepare formwork in advance and remove water, and debris from within forms.
      b. Pre-position reinforcement in advance of concrete pours.
      c. Pre-position waterstops, expansion joint materials, anchors, and/or embedded items in advance of concrete pours.
      d. Sprinkle subgrades sufficiently to eliminate water loss from concrete in accordance with ACI 301 Chapter 11.
   3. Conveying:
      a. Handle concrete from mixer to final deposit rapidly by methods which will prevent segregation or loss of ingredients to maintain required quality of concrete.
      b. Do not convey concrete through aluminum or aluminum alloy.

c. Do not place concrete with pumps or other similar devices without prior written approval of the ENGINEER.
d. Placing concrete by pumping methods shall conform to the applicable requirements of ACI 304R, Chapter 9, and ACI 304.2R.

4. Depositing:
   a. Do not drop concrete freely where reinforcing will cause segregation, nor more than four (4) feet.
   b. Deposit concrete in approximately horizontal layers of 12 to 18 inches.
   c. Do not allow concrete to flow laterally more than three feet.
   d. Place concrete at such a rate that concrete which is being integrated with fresh concrete is still plastic.
   e. Do not deposit concrete on concrete which has hardened sufficiently to cause the formation of seams or planes of weakness within sections.
   f. Do not use concrete which has partially hardened or has been contaminated by foreign materials.
   g. Do not subject concrete to procedures which will cause segregation.
   h. Do not place concrete in forms containing standing water.
   i. Make placement within sections continuously to produce monolithic unit.
   j. Do not begin placement of concrete in beams or slabs until concrete previously placed in walls or columns have attained initial set.
   k. Do not bend reinforcement out of position when placing concrete.
5. Consolidation:
   a. Consolidate concrete by vibration, spading, rodding, or other manual methods. Work concrete around reinforcement, embedded items and into corners; eliminate all air or stone pockets and other causes of honeycombing, pitting or planes of weakness.
   b. Use vibration equipment of internal type and not the type attached to forms and reinforcement.
   c. Use vibrators capable of transmitting vibration to concrete in frequencies sufficient to provide satisfactory consolidation.
   d. Do not leave vibrators in one spot long enough to cause segregation. Remove concrete segregated by vibrator operation.
   e. Do not use vibrators to spread concrete.
   f. Have sufficient reserve vibration equipment to guard against shutdown of work occasioned by failure of equipment in operation.
6. Hot Weather Concreting: Perform hot weather concrete work in accordance with ACI 305R and the following additional requirements.
   a. Temperature of concrete delivered at the job-site shall not exceed 90 degrees F.
   b. Cool ingredients before mixing to prevent temperature in excess of 90 degrees F.
   c. Make provisions for windbreaks, shading, fog spraying, sprinkling or wet cover when necessary.

C. Finishing:
   1. General:

a. Finish concrete in the various specified manners either to remain as natural concrete or to receive an additional applied finish or material.

2. Formed Surfaces:
   a. "Rough Form" finish: Surface may include roughness and irregularities not to exceed ½ inch, but tie holes and defects shall be patched.
3. Unformed Surfaces:
   a. In concrete having unformed surfaces, use just sufficient mortar to avoid the necessity for excessive floating. Slope exposed unformed surfaces to provide quick, positive drainage and to avoid puddles in low spots. Slope all surfaces exposed to weather 1/4 inch per foot for drainage unless noted otherwise on DRAWINGS.
   b. "Floated" Finish: After concrete has been placed, consolidated, struck off and leveled, do not work further until ready for floating. Begin floating when water sheen has disappeared and when the surface has stiffened sufficiently to permit the operation. During or after first floating, check planeness of surface with a ten foot straightedge applied at not less than two different angles. Cut down high spots and fill low spots during this procedure to produce a surface with true planes within 1/4 inch in ten feet as determined by a ten foot straightedge placed anywhere on the surface in any direction.

3.04 CURING AND PROTECTION

A. General: Immediately after placement and finishing, protect concrete from premature drying, excessive hot temperatures and mechanical injury. Perform curing by water curing, sheet form curing, or liquid membrane forming methods in accordance with ACI 308. Cure concrete continuously for a minimum of seven days at ambient temperatures above 40 degrees F.

B. Hot Weather Curing: See Hot Weather Concreting this Section.

C. Application of Liquid Curing Compound:
   1. Finishing operations must be completed prior to application. Apply compound as soon as the free water on the surface disappears and no water sheen is visible. Surface shall be capable of taking walking workmen without being marred. Apply compound in two (2) applications.
   2. Do not apply curing compound to construction joint surfaces. Protect exposed reinforcement during application of curing compound. Water cure those areas not coated with compound.
   3. Do not use liquid curing compounds on concrete surfaces which will receive later treatments, such as hardeners, special finishes, protective coating, damp proofing, waterproofing, future grout, grout fill, or coatings.

D. Curing of surfaces to receive Membrane Waterproofing shall be controlled by water fog spraying, water damped coverings, and/or impermeable sheet film cover for the full 7-day period specified above. All concrete surfaces shall have a minimum cure of 28 days before application of the membrane. The use of liquid membrane-forming curing compounds on these surfaces is prohibited.

E. Finished surfaces shall be protected from the direct rays of the sun to prevent checking and crazing.

3.05 FIELD QUALITY CONTROL

A. The CONTRACTOR shall perform the following field testing:
   1. Slump: ASTM C 143; One test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
   2. Concrete Temperature: ASTM C 1064; One test hourly when air temperature is when 80 deg F and above, and one test for each composite sample.
   3. Prepare and submit all reports to the ENGINEER.
   4. Immediately notify the ENGINEER of any test results which do not conform to the Specification requirements.

B. The OWNER reserved the right to perform any additional test, including:
   1. Obtain composite samples in accordance with ASTM C172.
   2. Mold and cure three test specimens for each strength test in accordance with ASTM C 31 and as follows:
      a. Concrete compression test: Use standard 6 inch x 12 inch cylinders.
      b. Identify each test by number, mix, amount of admixture, origin of sample in the structure, the date the test specimen was made, the date the test specimen was tested, the amount of slump determined, and the compressive and flexural strength test results.
      c. Test Methods:
         1) Compressive strength test: ASTM C39.
         2) Test one specimen at 7 days for information and test two specimens at 28 days for acceptance. A strength test is the average of the strengths of the two cylinders tested at 28 days.
         3) Perform one strength test for each 50 cu. yds. of concrete poured, unless waived by the ENGINEER, but not less than one test for each structure.
   3. Make slump tests for each truck load (upon truck arrival) or each on-site mixed batch at the job-site and whenever consistency of concrete appears to vary in accordance with ASTM C 143.
   4. Evaluation and Acceptance:
      a. The strength level of the concrete will be considered satisfactory if the averages of all sets of three consecutive strength tests equal or exceed specified strength and no individual strength test result is below specified strength by more than 500 psi.
      b. If the concrete fails to meet the specified strength requirements the ENGINEER may require one or both of the following:
         1) The ENGINEER shall have the right to order a change in the mix proportions for the remaining concrete being poured.
         2) The ENGINEER may order tests on the in-place concrete. Testing shall be in accordance with ACI 301 at no increase in contract price.

3.06 REPAIR OF DEFECTIVE CONCRETE

A. Defective Concrete
   1. Porous areas, open or porous construction joints and honeycombed concrete will be considered to indicate that the requirements for mixing, placing and handling have not been complied with and will be sufficient cause for rejection of the members of the structure thus affected.
   2. Defective work exposed upon removal of forms shall be entirely removed or repaired within forty-eight hours after forms have been removed.
   3. Repaired areas will not be accepted if:
      a. The structural requirements have been impaired by reducing the net section of compression members.
      b. The bond between the steel and concrete has been reduced.
      c. The area is not finished to conform in every respect to the texture, contour, and color of the surrounding concrete.
   4. If the above requirements are not satisfied or if there are excessive honeycombs or other defects, the ENGINEER may require that the members of unit involved be entirely removed and satisfactorily replaced at no additional expense to the STATE.
   5. The ENGINEER will determine the extent and manner of action to be taken for the correction of defective concrete as may be revealed by surface defects or otherwise.
      a. Prior to repair of structural defects or defects which impair watertightness (shrinkage cracks, etc.), submit proposed material and repair methods to the ENGINEER.
   6. As soon as the forms have been stripped and the concrete surfaces exposed, remove fins and other projections, fill recesses left by the removal of form ties, and repair surface defects which do not impair structural strength. Clean all exposed concrete surfaces and adjoining work stained by leakage of concrete to the satisfaction of the ENGINEER.
   7. Hammer pack tie holes and other small cavities with a stiff mortar of the same material, but somewhat leaner than that in the concrete. Clean the cavity and the area wetted before mortar is placed.
   8. Repair and patch defective areas with cement mortar of mix proportions and materials identical to those used in the surrounding concrete. Produce a finish on the patch that is indistinguishable from the surrounding concrete.
   9. Where the honeycomb or voids are not excessive and repairs are authorized by the ENGINEER, chip out the defective areas in a square shape to sound solid concrete with a depth not less than 2 inches. Make edges of cuts perpendicular to concrete surface or slightly undercut to provide a key at the edge of the patch. Before placing cement mortar, thoroughly clean, dampen and brush coat area to be patched with neat cement grout. Other patching materials may be used if accepted by ENGINEER in writing prior to start of repair work. The patch should be kept damp for seven days at a temperature above 50°F.
   10. Additional testing and inspecting due to repairs and/or defective concrete will be at the CONTRACTOR'S expense.

END OF SECTION

SECTION 05 50 00

METAL FABRICATIONS

PART 1 GENERAL

1.01 SUMMARY

A. All specialty metal items required to complete the Work in accordance with the intent of the DRAWINGS and SPECIFICATIONS shall be furnished and installed, regardless of whether or not specifically shown or described. Such items include loose or embedded items of structural shapes, plates and bars, welded plate inserts, fabrications, and similar items. Bolts, expansion anchors, and other fastening devices, which may or may not be provided with the indicated or specified items, shall also be furnished and installed as required for attachment and support.

B. Related Sections:
   1. Section 01 33 00 - Submittal Procedures

1.02 SECTION INCLUDES

A. Miscellaneous fabrications include, but are not limited to the following:
   1. Grating, frames and anchors.
   2. Corrosion protection.

1.03 REFERENCES

A. American Society for Testing and Materials:
   1. ASTM A108, Standard Specification for Steel Bars, Carbon, Cold Finished, Standard Quality.
   2. ASTM A123/A123M, Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   3. ASTM A153/A153M, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
   4. ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
   5. ASTM A325, Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength.
   6. ASTM A500, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
   7. ASTM A572, Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel.
   8. ASTM 780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.

B. American Welding Society (AWS)
   1. AWS A2.4, Standard Symbols for Welding, Brazing, and Nondestructive Examination.

2. AWS D1.1/D1.1M, Structural Welding Code - Steel.

C. NAAMM Metal Bar Grating Manual, Current Edition

D. Society for Protective Coatings (SSPC)

1.04 SUBMITTALS

A. Submittals shall be made in accordance with Section 01 33 00 – Submittal Procedures.
1. Shop Drawings:
a. Shop Drawings shall be provided for all metal fabrications and shall indicate all shop and erection details, including cuts, copes, connection, holes, threaded fasteners, rivets, and welds.
1) All welds, both shop and field, shall be indicated by AWS Welding Symbols.
2) Show all types of coatings.
3) Submit certified copies of the qualifications records of each welder prepared within six months of time of Contract award.

1.05 QUALITY ASSURANCE

A. Welder Qualifications: Welds shall be made only by welders, tackers, and welding operators who are currently qualified by tests as prescribed in the Structural Welding Code, AWS D1.1 of the American Welding Society to perform the type of work required.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store steel above the ground surface on platforms, skids, blocking, or other supports.

B. Protect from exposure to conditions that produce rust.

C. Handle steel so no parts are bent, broken, or otherwise damaged, and avoid damage to other material and work.

PART 2 PRODUCTS

2.01 STAINLESS STEEL RODS, NUTS, BOLTS, AND WASHERS

A. Bolts, Nuts, and Washers: ASTM A307 or ASTM A325, galvanized to ASTM A153/A153M where connecting galvanized components.

2.02 MISCELLANEOUS STEEL SHAPES

A. Materials - Steel:
1. Plates: ASTM A572, Grade 50.
2. Steel Tubing: ASTM A500, Grade B, cold-formed structural tubing.
3. Welding Steel Materials: AWS D1.1.

B. Metal Grating: Removable type. Where panel sizes are not indicated, limit panel weights to a maximum of 120 pounds each. Construction details in conformance with NAAMM Metal Bar Grating Manual or approved equal.
   1. Performance Criteria:
      a. Grating depth designed for maximum deflection of 1/4 inch.
      b. Maximum Stress: 20,000 psi for clear span shown on DRAWINGS.
      c. Bearing Bars: 3/16 inch thick, minimum.
      d. Surface: Serrated Surface.
      e. Acceptable Manufacturers:
         1) Ohio Gratings, Inc.; SGSS Series.
         2) McNichols Company.
         3) Amico Grating.
         4) Or Approved Equal.

C. Finishes - Steel:
   1. Cleaning Structural Steel. If rust, mill scale, dirt, oil, grease or other foreign substances have accumulated prior to galvanizing, steel surfaces shall be cleaned by a combination of caustic cleaning and cleaning according to SSPC Standards.
   2. Galvanizing of Structural Steel Members: Galvanize after fabrication to ASTM A123/A123M requirements. Provide minimum 2.0 oz/sq ft galvanized coating.
   3. Galvanizing of Non-Structural Items: Galvanize after fabrication to ASTM A123/A123M requirements.

2.03 FABRICATION

A. Fit and shop assemble items in largest practical sections for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Continuously seal joined members by continuous welds.

D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.04 FABRICATION TOLERANCES

A. Squareness: 1/8-inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16-inch.

C. Maximum Misalignment of Adjacent Members: 1/16-inch.

D. Maximum Bow: 1/8-inch in 48-inches.

E. Maximum Deviation from Plane: 1/16-inch in 48-inches.

PART 3 EXECUTION

3.01 INSPECTION

A. Examine areas and conditions under which metal fabrications are to be installed. Should any condition be found unsuitable, no work shall be done until unsuitable conditions have been corrected and are acceptable to CONTRACTOR. Proceeding with work will imply acceptance of the conditions by CONTRACTOR.

3.02 PREPARATION

A. Field Verification: Verify measurements in field, as required, for work fabricated to fit job conditions. Examine adjoining work on which metal fabrication work is in any way dependent on for workmanship or fit. Provide corrective work as may be necessary.

B. Coordination: Coordinate placement of anchorage in concrete or masonry construction with other trades.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. All bolting holes provided in equipment which require mounting shall be used as specified and intended.

C. Allow for erection loads and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

D. Obtain the ENGINEER's approval prior to site cutting or making adjustments not scheduled.

3.04 FIELD TOUCH UP

A. Galvanizing Repair: Provide field touch up on galvanized metals not embedded in concrete or masonry in accordance with ASTM A 780. Repair galvanized items damaged by welding cutting or by handling during shipping, installation or other means before the project is accepted by the STATE. Do not heat surfaces that repair paint has been applied to.

END OF SECTION

SECTION 31 11 00

CLEARING AND GRUBBING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Work includes removal of all debris, grass, weeds, shrubs, timber and other deleterious material from the construction areas shown on the DRAWINGS and approved by the STATE.

B. Site clearing and grubbing in the limits of the proposed work.

C. Related Sections:
   1. Section 01 50 00 Temporary Facilities and Controls
   2. Section 31 25 00 Erosion and Sediment Control

1.02 REFERENCES

A. Hawaii Department of Transportation (HDOT) 2005 Standard Specifications for Road and Bridge Construction.
   1. Section 201 – Clearing and Grubbing

B. Kauai County Code, Chapter 10 – Erosion and Sediment Control

1.03 PROJECT CONDITIONS

A. Environmental Requirements: Exercise necessary means and methods to control dust on site during performance of work.

B. Protection:
   1. Preserve structures and objects, including trees and shrubs designated to remain. Means and methods used for protection are discretionary.
   2. Use required protective measures during felling of trees and debris removal to provide for safety of employees and others.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 INSPECTION

A. Prior to performance of actual work, carefully inspect entire site and locate structures, objects, and plant life designated to be preserved.

3.02 PERFORMANCE

A. Implement erosion control measures prior to and during performance of work of this Section. Erosion control as specified in Specification Section 31 25 00.

B. The limits of the disturbance shall not be more than 5 feet outside of required work areas except as shown on the DRAWINGS or otherwise approved by the STATE.

3.03 CLEARING AND GRUBBING

A. Clearing shall mean removing, hauling and disposing of all trees, shrubs, grasses, weeds, debris, trash, rubble, downed timber, branches and other materials on the surface.

B. Clear and grub in accordance with Hawaii Department of Transportation (HDOT) 2005 Standard Specifications for Road and Bridge Construction, Section 201, Clearing and Grubbing.

3.04 MAINTENANCE OF CLEARED AREAS

A. Maintain cleared work areas in a condition free from additional vegetation growth for the duration of the project. Use of herbicides to discourage plant growth shall not be allowed. CONTRACTOR will be compensated for clearing each work area only once.

3.05 DISPOSAL

A. Disposal of all brush, tree trunks, stumps, roots and debris from clearing operations as required by Section 01 50 00 Temporary Facilities and Controls

B. Burning in not allowed.

END OF SECTION

SECTION 31 25 00

EROSION AND SEDIMENT CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Design, install, maintain, and remove erosion protection and sediment control.

B. Related Sections
   1. Section 01 50 00: Temporary Facilities and Controls

1.02 DEFINITIONS

A. Sediment and Erosion Control devices as defined herein shall mean silt fences, hay bales, fiber rolls, sandbag cofferdams, sediment ponds, sediment traps, or other devices approved by the STATE or ENGINEER.

1.03 SUBMITTALS

A. Shop Drawings:
   1. Erosion Protection and Sediment Control Plan. Conform to applicable permits, laws, and regulations as required by the County of Hawaii, and as described in Section 01 50 00 - Temporary Facilities and Controls, submitted at least 30 days prior to mobilization.
   2. BMP Product Data.
   3. Erosion Control Plan updates.
   4. The CONTRACTOR shall be responsible for obtaining a Construction General Permit (if necessary) for the project.

1.04 REFERENCES

A. US Environmental Protection Agency, Interim Guidance, A Guide for Construction Sites. EPA 833-R-060-04, January 2007.

B. Hawaii County Code, Chapter 10, Erosion and Sedimentation Control.

PART 2 PRODUCTS

2.01 CONSTRUCTION ENTRANCES:

A. Aggregate:
   1. Provide coarse aggregate conforming to the requirements for Size Number 1 as specified in AASHTO M 80.

2.02 FIBER ROLLS:

A. Fiber rolls should be prefabricated.

B. Fiber rolls may come manufactured containing polyacrylamide (PAM), a flocculating agent within the roll. Fiber rolls impregnated with PAM provide additional sediment removal capabilities and should be used in areas with fine, clayey or silty soils to provide additional sediment removal capabilities. Monitoring may be required for these installations.

C. Fiber rolls are made from weed free rice straw, flax, or a similar agricultural material bound into a tight tubular roll by netting.

D. Typical fiber rolls vary in diameter from 9 in. to 20 in.

2.03 ROCK BARRIER SEDIMENT TRAPS:

A. Rock:
   1. Provide sound, hard rock that is free from structural defects and foreign substances such as soil, shale, and organic materials.
   2. Shape:
      a. Provide angular-shaped rocks, with neither their width nor their thickness less than one-third of their length.
   3. Specific Gravity (Minimum):
      a. Provide rock having a minimum specific gravity of 2.5 determined according to the requirements specified in AASHTO T 85 for bulk-saturated aggregate, but on a surface-dry basis.
   4. Size and Gradation:
      a. Ensure that each load of rock is well-graded, D50 = 12-inch or from the smallest to the largest acceptable size as indicated in Table 31 25 00-1.

Table 31 25 00-1 Rock Size and Gradation for Rock Barriers

Rock Size (Inches)	Percent Passing (Square Openings)
12	100
6	15-50
3	0-15

2.04 OTHER MATERIALS:

A. Provide other materials as required and approved by the ENGINEER.

PART 3 EXECUTION

3.01 SEDIMENT AND EROSION CONTROL

A. Install sediment and erosion controls prior to work involving site clearing, stripping and stockpiling topsoil, excavation, and earthwork.

B. Maintain and repair sediment and erosion controls during course of construction.

3.02 REMOVAL OF TEMPORARY FACILITIES

A. Do not remove erosion control facilities without written approval from STATE or ENGINEER.

B. All erosion control facilities will be the property of CONTRACTOR, and shall be removed and disposed of offsite after all Work is complete.

C. Remove and dispose of sediments collected in the sediment control systems in accordance with State regulations.

3.03 MAINTENANCE

A. Begin maintenance operations immediately and continue throughout construction period until Contract is completed. Inspect sediment control structures and repair after each storm.

3.04 SOIL EROSION AND SEDIMENTATION PLAN

A. An approved Erosion and Sedimentation Control Plan is indicated on DRAWINGS. Should CONTRACTOR desire to modify this Plan, obtain necessary approvals prior to implementing any provisions at no additional cost to STATE.

END OF SECTION

SECTION 31 37 00

GROUTED RIPRAP

PART 1 GENERAL

1.01 DESCRIPTION

A. Section Includes: Furnishing and placing of cement mortar and rocks to the lines and grades shown on the DRAWINGS and as specified under these SPECIFICATIONS.

B. Related Sections:

1.02 REFERENCES

A. American Society for Testing and Materials.
   1. ASTM C127 - Standard Test Method for Density, Relative Density (Specific Gravity), and Absorption of Coarse Aggregate
   2. ASTM C138 - Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete.
   3. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete.
   4. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.

B. HDOT 2005 Standard Specifications for Bridge and Road Construction as amended.

1.03 SUBMITTALS

A. Source of Materials: Submit source of all Riprap stone within 30 days of scheduled rip-rap work to be performed.

B. Riprap sample stockpile: Samples of riprap rock at the Site (see also Article 1.04.B).

C. Grout Mix Design.

D. Delivery Tickets (if ready-mix is batched offsite)

E. Grout Test Results (of mixed on-site).

1.04 QUALITY ASSURANCE

A. Furnish each aggregate material from single source throughout the work.

B. Site Samples:
   1. Provide one Sample of riprap rock at the Site weighing at least two (2) hundred pounds and having the gradation specified for the type of riprap represented by the Sample for inspection by the ENGINEER prior to placing riprap. Following inspection and acceptance, the Sample may be incorporated into the finished product.

PART 2 PRODUCTS

2.01 MATERIALS

A. Riprap:
   1. Specific Gravity (Density) - All stones composing the riprap should have a specific gravity equal to or exceeding 2.4, following the standard test ASTM C127.
   2. Durability - Durability addresses the in-place performance of the individual rock particles, and also the transportation of riprap to the construction site. In-place deterioration of rock particles can occur during transportation to the site. The rock particles must have sufficient strength to withstand abrasive action without reducing the gradation below specified limits. Qualitatively, a stone that is hard, dense, and resistant to weathering and water action should be used. Rocks derived from igneous and metamorphic sources provide the most durable riprap.
   3. Shape - The stones shall be angular with relatively flat faces that form a mass having an angle of internal friction greater than rounded stones, and therefore will be less susceptible to slope failures. Not more than 25 percent of the stones shall have a length more than 2.5 times the breadth. The shape of the riprap stone shall be cubical in nature, rather than elongated. The length is the longest axis through the stone, and the breadth is the shortest axis perpendicular to the length. Angularity is a qualitative parameter which is assessed by visual inspection. No standard tests are used to evaluate this specification.
   4. Characteristic Size - The characteristic size in a riprap gradation is the *d*50. This size represents the average diameter of a rock particle for which 50 percent of the gradation is finer, by weight. The d50 size is shown on the plans.
   5. Gradation - The maximum stone size is 2 times the *d*50 and the recommended minimum size is one-third of the *d*50.

B. Grout:
   1. Portland Cement in accordance with HDOT Standard Specifications Section 701.01.
   2. Fine Aggregate for Concrete in accordance with HDOT Standard Specifications Section 703.01.
   3. Water in accordance with HDOT Standard Specifications Section 712.01.
   4. Grout shall consist of 1 part Portland cement to 3 parts fine aggregate by volume.

C. Curing compound:
   1. Liquid membrane-forming concrete curing compound per ASTM C309.

PART 3 EXECUTION

3.01 GENERAL

A. Unless specified otherwise, Perform work in accordance with HDOT 2005 Standard Specifications for Bridge and Road Construction as amended.

3.02 PREPARATION

A. Subgrade: The subgrade surface on which the rock riprap is to be placed shall be cut or filled and graded to the lines and grades shown on the DRAWINGS. When fill to subgrade lines is required, it shall consist of approved material and shall be compacted to a density equal to the adjacent existing soil material. Rock riprap shall not be placed until the foundation preparation is completed and the subgrade surface has been inspected by the ENGINEER.

3.03 HANDLING AND MEASUREMENT OF GROUT MATERIAL

A. Material shall be stockpiled and batched by methods that prevent segregation or contamination of aggregates and ensure accurate proportioning of the mix ingredients. Except as otherwise approved, cement and aggregates shall be measured as follows:
   1. Cement shall be measured by weight or in bags of 94 pounds each. When cement is measured in bags, no fraction of a bag shall be used unless weighed.
   2. Aggregates shall be measured by weight. Mix proportions shall be based on the batch weight of each aggregate saturated, surface-dry weight plus the weight of surface moisture it contains at the time of batching.
   3. Water shall be measured, by volume or by weight, to accuracy within 1 percent of the total quantity of water required for the batch.
   4. Admixtures shall be measured within a limit of accuracy of plus or minus 3 percent.

3.04 MIXERS AND MIXING

A. The mixer, when operating at capacity, shall be capable of combining the ingredients of the grout mix into a thoroughly mixed and uniform mass and of discharging the mix with a satisfactory degree of uniformity.

B. The mixer shall be operated within the limits of the manufacturer's guaranteed capacity and speed of rotation.

C. The time of mixing after all cement and aggregates have been combined in the mixer shall be a minimum of 1 minute for mixers having a capacity of 1 cubic yard or less. For larger capacity mixers, the minimum time shall be increased 15 seconds for each cubic yard or fraction thereof of additional capacity. The batch shall be so charged into the mixer that some water will enter in advance of the cement and aggregates, with the balance of the mixing water introduced into the mixer before a fourth of the total minimum mixing time has elapsed.

D. When ready-mix grout is furnished, the CONTRACTOR shall furnish to the ENGINEER at the time of delivery a ticket showing the time of loading and the quantities of material used for each load of grout mix delivered.

E. No mixing water in excess of the amount required by the approved job mix shall be added to the grout mix during mixing or hauling or after arrival at the delivery point.

3.05 PLACEMENT

A. Hand-Place Rock:
   1. The rock riprap shall be placed by hand on the surface and to the depth specified. It shall be securely bedded with the larger rocks firmly in contact one to another without bridging. Spaces between the larger rocks shall be filled with smaller rocks and spalls. Smaller rocks shall not be grouped as a substitute for larger rock.

B. Grout:
   1. The grout mix shall be delivered to the site and placed within 1.5 hours after the introduction of the cement to the aggregates. In hot weather or under conditions contributing to accelerated stiffening of the concrete, the time between the introduction of the cement to the aggregates and complete discharge of the grout batch shall be a maximum of 45 minutes. The ENGINEER may allow a longer time provided the setting time of the grout is increased a corresponding amount by the addition of an approved set-retarding admixture. In any case concrete shall be conveyed from the mixer to the final placement as rapidly as practicable by methods that prevent segregation of the aggregates, loss of mortar, displacement of the rock riprap, or a combination of these.
   2. Grout mix shall not be allowed to free fall more than 5 feet unless suitable equipment is used to prevent segregation.
   3. The grout mix shall not be placed until the rock riprap has been inspected and approved by the ENGINEER for the placement of grout.
   4. Rock to be grouted shall be kept moist for a minimum of 2 hours before grouting.
   5. The rock riprap shall be flushed with water before placing the grout to remove the fines from the rock surfaces. The rock shall be kept moist before the grouting and without placing in standing or flowing water. Grout placed on inverts or other nearly level areas may be placed in one operation. On slopes, the grout shall be placed in two nearly equal applications consisting of successive lateral strips about 10 feet in width starting at the toe of the slope and progressing upward. The grout shall be delivered to the place of final deposit by approved methods and discharged directly on the surface of the rock. A metal or wood splash plate is used to prevent displacement of the rock directly under the grout discharge. The flow of grout shall be directed with brooms, spades, or baffles to prevent grout from flowing excessively along the same path and to assure that all intermittent spaces are filled. Sufficient barring shall be conducted to loosen tight pockets of rock and otherwise aid in the penetration of grout to ensure the grout fully penetrates the total thickness of the rock blanket. All brooming on slopes shall be uphill. After the grout has stiffened, the entire surface shall be rebroomed to eliminate runs and to fill voids caused by sloughing. The surface finish, following the completion of grout installation, shall consist of onethird of the rock extended above the level of grout. The exposed rock will not have a plastered appearance.
   6. After completion of any strip or panel, no individual(s) or equipment shall be permitted on the grouted surface for 24 hours. The grouted surface shall be protected from injurious action by the sun, rain, flowing water, mechanical injury, or other potential damaging activity.

C. Curing and Protection:
   1. The completed finished surface shall be prevented from drying for a minimum curing period of 7 days following placement. Exposed surfaces shall be maintained in a moist condition continuously for the 7-day curing period or until curing compound has been applied as specified in this section. Moisture shall be maintained by sprinkling, flooding, or fog spraying or by covering with continuously moistened canvas, cloth mats, straw, sand, or other approved material. Water or moist covering shall be used to protect the grout during the curing process without causing damage to the grout surface by erosion or other mechanisms that may cause physical damage.
   2. A continuous moisture condition shall be maintained during the curing period. The compound shall be sprayed on the moist grout surface as soon as free water has disappeared and all surface finishing has been completed. The compound shall be applied at a minimum uniform rate of 1 gallon per 175 square feet of surface and shall form a continuous adherent membrane over the entire surface. Curing compound shall not be applied to surfaces requiring bond to subsequently placed grout and/or concrete. If the membrane is damaged during the curing period, the damaged area shall be resprayed at the rate of application specified for the original treatment.

3.06 INSPECTING AND TESTING

A. The grout material shall be checked and tested throughout the grouting operation. Sampling of fresh grout shall be conducted in conformance with ASTM C 172. The volume of each batch will be determined by methods prescribed in ASTM C 138.

B. The ENGINEER shall have free access to all parts of the CONTRACTOR'S plant and equipment used for mixing and placing grout during the period of the contract. Proper facilities shall be provided for the ENGINEER to sample material and view processes implemented in the mixing and placing of grout as well as for securing grout test samples. All tests and inspections shall be conducted so that only a minimum of interference to the CONTRACTOR'S operation occurs.

C. For ready-mixed grout, the CONTRACTOR shall furnish to the ENGINEER a statement-of-delivery ticket for each batch delivered to the site. The ticket shall provide as a minimum: weight in pounds of cement, aggregates (fine and coarse), water; weight in ounces of air-entraining agent; time of loading; and the revolution counter reading at the time batching was started.

END OF SECTION

SECTION 34 71 13

VEHICLE W-BEAM GUARDRAIL

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Provisions for new guardrail beam, posts, end treatment, height transition section, connections and accessories. See DRAWINGS for additional information.

B. Related Sections:
   1. Section 01 33 00 – Submittal Procedures
   2. Section 01 57 00 – Temporary Pollution Controls
   3. Section 05 50 00 – Metal Fabrication.

1.02 REFERENCES

A. American Society for Testing and Materials:
   1. ASTM A123/123M – Standard Specification for Zinc (Hot-Dip Galvanized) coatings on iron or steel products.
   2. ASTM A307 – Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60,000 PSI Tensile Strength
   3. ASTM A153 – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel hardware.
   4. ASTM A653/A653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvennealed) by the Hot-Dip process.
   5. ASTM A741 – Standard Specification for Metallic-Coated Steel Wire Rope and Fittings for Highway Guardrail
   6. ASTM D4956 - Standard Specification for Retroreflective Sheeting for Traffic Control

B. American Association of State Highway and Transportation Officials (AASHTO)
   1. AASHTO Roadway Design Guide, Fourth Edition.
   2. AASHTO M180 – Standard Specification for Corrugated Sheet Steel Beams for Highway Construction.
   3. Manual for Assessing Safety Hardware (MASH), Second Edition

C. Federal Highway Administration (FHA)

1.03 SYSTEM DESCRIPTION

A. Design Requirements: Provide a new MASH compliant guardrail section, with height transition and end treatment to span the headwall/culvert crossing as shown on the DRAWINGS and meet the design requirements provided in this SPECIFICATION.

B. Basis of Design:

1. The guardrail design and length of need calculations were generated from the AASHTO Roadway Design Guide, 4th edition. See technical memorandum for more detailed information regarding the length-of-need calculations.
2. The guardrail barrier specifications are based on Road Systems, Inc. products (https://roadsystems.com/). The CONTRACTOR shall assume responsibility for changes to the guardrail barrier and all barrier components as well as additional expenses required should the CONTRACTOR use another approved equal product. CONTRACTOR shall submit shop drawings to ENGINEER, showing any deviations from the Road Systems, Inc guardrail barrier.

1.04 SUBMITTALS

A. Submit documentation as required to the STATE in accordance with the requirements of Section 01 33 00, Submittal Procedures:
   1. Inspector Qualifications:
      a. See Article 1.05 for minimum qualification requirements.
   2. Contractor Qualifications:
      a. The guardrail installation contractor's qualifications including a minimum of three references. See Article 1.05 for minimum qualification requirements.
   3. Existing guardrail inspection report and applicable components, including but not limited to:
      a. Guardrail condition (corrosion, damage, misalignment, etc.)
      b. Bolt attachment and condition and location
      c. Rail and beam attachment condition
      d. Guardrail height maintained throughout entire guardrail run length (variation of height greater than 1.5 inches shall be noted)
      e. Condition and alignment of block out posts.
      f. Post embedment (no tilting or soil erosion around the posts).
      g. Photographs showing guardrail condition and dimensions.
      h. Detailed inspection report documenting all additional findings, name of inspector and date of inspection.
   4. Shop Drawings:
      a. Catalog data for the guardrail, posts, block outs and end anchor indicating material compliance and design strength.
      b. Installation schedule showing intended construction duration and phases of construction.
      c. Installation drawings showing all details of construction, details required for guardrail installation, dimensions and guardrail alignment, beam splices and end anchor location with the installing contractor's certification.
      d. FHWA Acceptance Letters for:
         1) Offset Blocks
         2) Terminal for W-Beam Guardrail
   5. Installation Instructions
      a. Submit a copy of the manufacturer's end anchorage installation instructions prior to installation.
   6. Closeout Documents
      a. Submit final record drawings on in-place guardrail.

b. Manufacturer's operations and maintenance manual (if any).
c. Warranty information.

1.05 QUALITY ASSURANCE

A. The guardrail inspector shall have a minimum of 10 years' experience in guardrail and roadway design and be a licensed civil engineer registered and in good standing in the State of Hawaii.

B. The contractor installing the guardrail shall have at least 5 years' experience successfully installing vehicle w-beam guardrail within State right-of-way.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store steel above the ground surface on platforms, skids, blocking, or other supports.

B. Protect from exposure to conditions that produce rust.

C. Handle steel so no parts are bent, broken, or otherwise damaged, and avoid damage to other material and work.

1.07 WARRANTY

A. Furnish a two-year warranty: All work and products supplied under this specification section shall be fully warrantied by the CONTRACTOR for a minimum period of two (2) years from the date of acceptance by the STATE. Any defects of design, workmanship, or materials, that would result in non-compliance with the Contract SPECIFICATIONS, shall be fully corrected by the CONTRACTOR (including parts and labor) without cost to the STATE.

PART 2 PRODUCTS

2.01 GUARDAIL

A. Provide galvanized steel w-beam guard rail elements and fittings of the indicated design and details. The finished steel beam elements must be Class A (12-gauge base metal nominal thickness of 0.105 inch) and conform to the requirements of AASHTO M 180. Galvanizing of steel beam elements must be Type 1 (zinc coated 1.80 ounces per square foot, minimum single spot) and must conform to the requirements of AASHTO M 180.

B. Workmanship shall be equivalent to good commercial practice and all edges, bolt holes and surfaces shall be free of torn metal, burns, sharp edges and protrusions.

C. Guardrail shall be new. Previously used or scrapped guardrails shall not be used.

2.02 GUARDRAIL POSTS

A. Fabricate W6x9 "H" beam sections from steel conforming to either ASTM A36/A36M, ASTM A588/A588M or ASTM A242/A242M and conforming to the size, weight and dimensions indicated.

B. Galvanize posts in accordance with ASTM A123/A123M.

C. Guardrail posts shall be new. Previously used or scrapped posts shall not be used.

2.03 BOLTS AND HARDWARE

A. Bolts used with galvanized ASTM A36/A36M steel must conform to ASTM A307 except for rail splice bolts that shall be button headed.

B. Galvanize bolts, and all necessary hardware fabricated from ASTM A36/A36M steel galvanized in accordance with ASTM A153/A153M.

C. ASTM F3125/F3125M, Type 3 bolts may be used with ASTM A588/A588M or ASTM A242/A242M steel without galvanizing.

D. The CONTRACTOR shall supply the bolts, nuts, washers and any other miscellaneous hardware.

E. Bolts and hardware shall be new. Previously used or scrapped hardware shall not be used.

2.04 POLYMER AND POLYMER COMPOSITE OFFSET BLOCKS

A. Provide polymer and polymer composite offset blocks certified by the Federal Highway Administration (FHWA) to meet the requirements of AASHTO MASH. Submit a copy of the FHWA Acceptance Letter.

B. Block size shall match existing block dimension (8-inch or 12-inch) or as approved on the shop drawings.

C. Offsite blocks shall be new. Previously used or scrapped blocks shall not be used.

2.05 TERMINAL FOR W-BEAM GUARDRAIL

A. Provide a MSKT (MASH-compliant Sequential Kinking Terminal) terminal for w-beam guardrail including all supporting posts and hardware.

B. Galvanize in accordance with ASTM A123/A123M.

C. Provide terminal certified by the Federal Highway Administration (FHWA) to meet the requirements for AASHTO MASH. Submit a copy of the FHWA Acceptance Letter.

2.06 RETROREFLECTIVE SHEETING

A. Provide retroreflective sheeting conforming to ASTM D4956, Type III, IV, V, VII, VIII, IX or XI. All retroreflective sheeting must have a precoated adhesive which will permanently adhere to the metal surface.

2.07 ACCEPTABLE MANUFACTURER

A. Acceptable Manufacturer:
   1. Road Systems Inc.
      3616 Old Howard County Airport Road.
      Big Spring, TX 79720
   2. Approval Equal

2.08 SHIPPING

A. All components shall be packaged, wrapped, and otherwise protected from damage during shipment. Any repairs required, including coatings, shall be at the CONTRACTOR'S expense.

PART 3 EXECUTION

3.01 PRE-INSTALLATION INSPECTION

A. CONTRACTOR is to field verify existing guardrail and site condition.

B. In addition to verifying existing conditions, CONTRACTOR is to perform a field condition inspection and report applicable findings and report to ENGINEER. CONTRACTOR will not be given authorization to submit shop drawings and/or order materials until inspection report findings are approved by the ENGINEER.

3.02 INSTALLATION

A. Guardrail shall be placed to the lengths, alignment and grades as shown on the approved shop drawings except where directed otherwise by the ENGINEER or the STATE.

B. Guardrail components shall be installed per the manufacturer's specifications and recommendation.

C. Install posts to properly transition w-beam guardrail height from 28-inches to 31-inches per the DRAWINGS. Field drilling components, modifications or other non-manufacturer changes will not be accepted.

D. Posts
   1. Posts may be placed by driving or by setting in excavated holes. Post holes for guardrail posts must be round and at least 4 inches larger, in diameter, than the greater dimensions (not the diagonal) of the posts, and must be backfilled around

the posts with material removed or other suitable soil, placed in lifts not exceeding 4 inches, each lift thoroughly tamped.

2. In no case shall concrete or slurry be used to backfill post holes.
3. If solid rock is encountered in the area of Post 1 or Post 2, notify the ENGINEER immediately.
4. Remove posts which are broken, split or damaged in any other way and replace with a sound post. Carry on driving operations in such manner that nearby structures, shoulders, or pavements are not damaged.
5. Standard Posts:
    a. Drive the posts plumb, to a 40-inch depth with 32 inches exposed to support the 31-inch height W-beam guardrail.
6. Impact Head Posts:
    a. Drive the lower posts to a depth of 6-foot.
    b. Use a special driving cap to prevent damage to the welded plates.
7. Posts shall be plum and to the established lines and grades and shall be placed at 6-foot 3-inch intervals, unless directed otherwise on the construction DRAWINGS.
8. All backfill shall be compacted to 95% of Standard Proctor Density (ASTM D698).
9. See Section 01 57 00, Temporary Pollution Controls for pile driving noise restrictions.

E. Guardrail Beam Elements
1. Place and fasten the beam elements, fittings, and other parts of the guardrail as indicated. Erect the elements to produce a smooth, even rail, closely conforming to a line and grade parallel to the pavement.
2. Bolt the beam elements to each post, and make splices by lapping in the direction of traffic.
3. Splice only between posts (mid-span) except for the first splice with the existing w-beam.
4. Tighten all bolts in the finished rail.

F. Impact Head and End Anchorage
1. Install impact head and end anchorages in accordance with the manufacturer's instructions. Submit a copy of the manufacturer's impact head and end anchorage installation instructions prior to installation.

G. Signal reflectors shall be attached to posts at terminal sections, posts at the buried end sections, and to every fourth post in a length of guide rail. Silver reflectors shall be placed facing oncoming traffic and yellow reflectors shall be placed on the opposite side of the post except for divided highway. All reflectors shall comply with Hawaii Department of Transportation Standard Specifications regarding reflectorization.

3.03 WASTE MANAGEMENT AND DISPOSAL

A. Do not allow demolished materials to accumulate onsite. Containerize or otherwise store debris as work is in progress and/or dispose of demolished items and materials promptly.

B. Separate and recycle unused metal materials to metal recycling facility.

C. Except for items or materials indicated to be recycled, reused, salvaged, reinstalled, or otherwise indicated to remain STATE property, remove demolished materials from Site, and legally dispose of them in an EPA-approved landfill.

D. Comply with hauling and disposal regulations of the Authorities Having Jurisdiction (AHJ).

E. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

F. Dispose of demolition debris off Site in a lawful manner.

G. Hazardous Waste Landfill Records:
   1. Maintain documentation indicating the receipt and acceptance of the hazardous wastes by a landfill facility licensed to accept hazardous wastes for the record.

H. Burning debris on the Site is not permitted.

3.04 COMPLETED WORK INSPECTION

A. CONTRACTOR to inspect the completed guardrail work for compliance with the approved shop drawings and manufacturer's specifications.

END OF SECTION

SECTION 35 05 39

CONCRETE PIPE

PART 1 GENERAL

1.01 DESCRIPTION

A. Section includes: The requirements for the installation of precast concrete culverts in open cut, and includes the requirements for excavation, bedding, backfilling, and cover material.

B. Related Sections:
   1. Section 03 20 00: Concrete Reinforcement
   2. Section 03 30 00: Cast-in-Place Concrete

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM) International
   1. ASTM C 76 Standard Specification for Reinforced Concrete Culverts, Storm Drain, and Sewer Pipe
   2. ASTM C 443 Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets
   3. ASTM C 655 Standard Specification for Reinforced Concrete D-Load Culvert, Storm Drain and Sewer Pipe
   4. ASTM C 990 - Standard Specification for Joints for Concrete Pipe, Manholes, and Precast Box Sections Using Preformed Flexible Joint Sealants

B. American Association of State Highway and Transportation Officials
   1. AASHTO M 170 Standard Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe

C. County of Kauai Standard Specifications for Public Works Construction.

1.03 SUBMITTALS

A. The following shall be submitted in accordance with Section 01 33 00 Submittal Procedures:
   1. Manufacturer’s Pipe Catalog Data.
   2. Bedding Materials.

PART 2 PRODUCTS

2.01 MATERIALS

A. Rubber Gasket Reinforced Concrete Pipe:
   1. Reinforced concrete pipe shall conform to ASTM C 76. Class III (minimum rating) pipe shall be used.

2. Rubber gasket joints shall conform to ASTM C 990, or AASHTO M 170.
3. Acceptable Manufacturer's
   a. Jensen Precast
   b. Or approved equal

B. Pipe Collars:
   1. Class 'B' (2,500 psi) cast-in-place concrete per HDOT or Kauai County Standard Specifications and Specification Section 03 30 00, Cast-in-Place Concrete.
   2. Reinforcing per Specification Section 03 20 00, Concrete Reinforcing.

C. Bedding Material:
   1. 3/4-inch crushed rock base in conformance with Section 15 of the Kauai County Standard Specifications for Public Works Construction.
   2. Marafi RS380i geotextile fabric, or approved equal.

PART 3 EXECUTION

3.01 PREPARATION

A. Prepare bedding in accordance with the County of Kauai Standard Specifications for Public Works Construction, September 1986, Section 24 Drain Pipes.

3.02 INSTALLATION

A. Install irrigation pipes in accordance with the County of Kauai Standard Specifications for Public Works Construction, September 1986, Section 24 Drain Pipes and the manufacturer's specifications and recommendations. If a conflict arises between specifications, the more stringent specification shall be used.

END OF SECTION