DIVISION OF FORESTRY AND WILDLIFE

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

BOARD OF LAND AND NATURAL RESOURCES

Dawn N.S. Chang
Chairperson

CONTRACT SPECIFICATIONS AND PLANS

JOB NO. D00CK62C
NA PALI KONA FOREST RESERVE
STREAM CROSSINGS
WAIMEA COUNTY, KAUAI, HAWAII

Civil Engineer:	SSFM International, Inc.
Surveyor	ControlPoint Surveying, Inc.
Structural Engineer	Kai Hawaii Inc.

APRIL 2026

State of Hawaii
DIVISION OF FORESTRY AND WILDLIFE
ENGINEERING DIVISION
Honolulu, Hawaii

CONTRACT SPECIFICATIONS AND PLANS

JOB NO. D00CK62C
NA PALI KONA FOREST RESERVE
STREAM CROSSINGS
WAIMEA COUNTY, KAUAI, HAWAII

Approved: _____

DAVID G. SMITH
Administrator
Division of Forestry and Wildlife

Approved: _____

DINA U. LAU, P.E.
Acting Chief Engineer
Engineering Division

APRIL 2026

PLANS (Bound Separately)

DEPARTMENT OF LAND AND NATURAL RESOURCES INTERIM GENERAL CONDITIONS, DATED OCTOBER 1994 (Bound Separately)

NOTICE TO BIDDERS
(Chapter 103D, HRS)

COMPETITIVE BIDS for Job No. D00CK62C Stream Crossings at Na Pali Kona Forest Reserve, 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 Na Pali Kona Forest Reserve, Waimea, Hawaii.

The work shall generally consist of the following:

- New concrete ford crossing at Kawaikoi crossing
- Installation of revetment wall for Waiakoali crossing

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

A voluntary site visit/pre-bid conference will be held at the project site on May 4, 2026, at 9:30am. All attendees shall meet at the Kokee Lodge parking lot and four-wheel drive vehicle will be required for the site visit.

The estimated cost of construction is $420,000.00.

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

Since the estimated cost of construction is $250,000 or more, 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

CONTENTS

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. D00CK62C
Na Pali Kona Forest Reserve Stream Crossings, Waimea County, 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 repair and reconstruction of two separate steam crossings on the Kawaikoi and Waiakoali Streams, 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. D00CK62C
Na Pali Kona Forest Reserve Stream Crossings, Waimea County, Kauai, Hawaii

on file in the office of the Engineering Division for the TOTAL BASE BID (Items 1 to 10) of:

_____

_____Dollars ($_____)
and will fully complete all work under this contract within 300 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
		BASE BID			
1.		LS	Demolition Work; to include demolition, hauling & disposal as required to construct new improvements.		$_____
2.		LS	Erosion Control, as required to demolish existing ford and construct new improvements.		$_____
3.		LS	Stream Control and Dewatering, as required to demolish existing ford and construct new improvements.		$_____
4.		LS	Grading Work, as required to construct new improvements.		$_____
5.		LS	Ford Crossing, including concrete approach grade slabs, base course, and lean concrete, in place complete.		$_____
6.		LS	Scour Protection (GRP), in place complete.		$_____
7.	1	LS	Improvements to Waiakoali Stream Crossing.		$_____
8.		LS	Project Sign, in place complete.		$_____
9.	Allowance		Field Office		$ 10,000.00
				Subtotal Base Bid (Items 1-9)	$_____
10.		LS	Mobilization and Demobilization (not to exceed 10% of the Subtotal Base Bid)		$_____
				Total Base Bid (Items 1-10)	$_____

RECYCLED PRODUCTS PREFERENCE

This project allows a 10% price preference for recycled products in accordance with HRS 103D-1005. Please indicate your selection of 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 10) selected by the Board of Land and Natural Resources. Write the total of bid items 1 to 10 on page P-2.

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 one hundred eighty (180) 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 eighteen (18) months 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 and providing the work of the required specialty contractor, 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 "one hundred eighty (180)" 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 one hundred eighty (180) 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 replacing the last paragraph with the following:

In the event the Notice to Proceed is not issued within eighteen (18) months after the date of bid opening, the Contractor may submit a claim for increased labor and materials costs (but not overhead costs). The claim shall be for labor and material costs incurred after eighteen (18)

months and the full duration of the contract time allowed for the performance of the work (as specified on Page P-1 of the [Bid] PROPOSAL) have elapsed. Such claims shall be accompanied with the necessary documentation to justify the claim. No payments will be made for escalation costs that are not fully justified as determined by the State.

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.

TABLE OF CONTENTS

SECTION 01019

GENERAL SPECIFICATIONS

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

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

1.2 GENERAL

A. Examination of Premises: The Contractor shall contact the Engineer and obtain permission before visiting the site.

B. All lines and grades shall be established by a licensed surveyor , or licensed Civil Engineer, registered in the State of Hawaii. The Contractor shall submit evidence of current and valid registration.

C. Notices: The Contractor shall notify the Engineer and give at least three (3) working days notice before starting any work.

D. Disruption of Utility Services: All work related to the temporary disconnection of electrical system shall be pre-arranged with the Engineer so that any disruption of such services will be kept to a minimum. In the event temporary power hook-up is required, the Contractor shall provide the necessary services.

E. Contractor's Operations

1. The Contractor must employ, insofar as possible, such methods and means of carrying out the work so as not to cause any interruption or interference to the facility's operations. Where the Contractor's operations would result in interruptions which would hamper the operations of the facilities, the Contractor shall rearrange the schedule of work accordingly.

2. The Contractor shall maintain safe passageway to and from the facility for the user agency personnel and the public at all times.

F. Lead Paint

1. When the project includes paint to be disturbed that was applied prior to 1980, it shall be assumed to contain lead. The Contractor shall inform its employees, subcontractors, and all other persons engaged in the project that lead containing paints are present in the existing buildings at the job site and to follow the requirements of the Department of Labor and Industrial Relations, Division of Occupational Safety and Health, Title 12, Subtitle 8,Chapter 148, Lead Exposure in Construction, Hawaii Administrative Rules (Chapter 12-148, HAR).

G. Parking Policy for Contractor

1. The Contractor and its employees will not be allowed to park in zones assigned to facility personnel.

2. Areas to be used by the Contractor shall be as designated by the Engineer. Any lawn damaged by the Contractor shall be restored as instructed by the Engineer at no cost to the State.

H. Toilet Accommodations: The Contractor may use the existing toilet facilities if so designated by the Engineer; however, it is the Contractor's responsibility to keep same clean and in a sanitary condition at all times.

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

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

K. Safety: The Contractor shall carefully read and strictly comply with the requirements of the Hawaii Occupational Safety and Health Law, Chapter 396, Hawaii Revised Statutes, as amended, is applicable and made a part of the Contract.

L. Clean Up Premises: The Contractor shall clean up and remove from premises all debris accumulated from operations as necessary or as directed. See also Section 7.25 of the General Conditions.

M. Responsibility

1. The State will hold the Contractor liable for all the acts of Subcontractors and shall deal only with the prime Contractor in matters pertaining to other trades employed on the job. The Contractor shall be responsible for coordinating the work of all trades on the job.

2. Should the Contractor discover any discrepancy in the plans or specifications, the Contractor shall immediately notify the Engineer before proceeding any further with the work, otherwise, the Contractor will be held responsible for any cost involved in correction of work placed due to such discrepancy.

N. Cooperation With Other Contractors: The State reserves the right at any time to contract for or otherwise perform other or additional work within the contract zone limits of this Contract. The Contractor of this project shall, to the extent ordered by the State, conduct its work so as not to interfere with or hinder the progress or completion of the work performed by other contractors.

O. Division of the Work: The Divisions and Sections into which these Specifications are divided shall not be considered an accurate or complete segregation of work by trades.

This also applies to all work specified within each Section.

P. Drawings and Specifications

1. The Contractor shall not make alterations in the drawings and specifications. In the event the contractor discovers any errors or discrepancies, the Contractor shall immediately notify the Engineer in accordance with the General Conditions.

2. Where devices, or items, or parts thereof are referred to in the singular, it is intended that such reference shall apply to as many such devices, items or parts as are required to properly complete the work.

3. Specifications and drawings are prepared in abbreviated form and include incomplete sentences. Omission of words or phrases such as "the Contractor shall", "as shown on the drawings", "a", "an", and "the" are intentional. Omitted words and phrases shall be provided by inference to form complete sentences.

Q. Required Submittals

1. Required submittals as specified in the Technical Sections of these specifications include one or more of the following: Shop drawings; color samples; material samples; technical data; schedules of materials; schedules of operations; guarantees; operating and maintenance manuals; and as-built drawings.

2. The Contractor shall make a comprehensive list of the required submittals, by Specification Section, and submit this list to the Engineer within 15 days after notice to proceed.

3. As-Built Drawings: When as-built drawings are required for submittal, the following shall apply:

a. As-built drawings, the intent of which is to record the actual in-place construction so that any future renovations or tie-ins can be anticipated accurately, shall be required.

b. All deviations from alignments, elevations and dimensions which are stipulated on the plans shall be recorded in red on the as-built drawings.

c. The following procedure shall be followed:

1) Immediately after these changes are constructed in place, the Contractor shall record them on the field office plans.

2) Within two weeks after final inspection of the project, the Contractor shall transfer the changes marked on the field office plans onto a clean copy of plans using a red pencil. Any deletions shall be so noted and redrawn as necessary. The Contractor shall stamp or mark the tracings "AS-BUILT", and also sign and date each drawing so marked.

3) The Contractor shall submit the as-built drawings 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.

4) Any as-built drawing which the Engineer determines does not accurately record the deviation shall be corrected by the State, and the Contractor shall be charged for the services.

END OF SECTION

SECTION 01090

STANDARD REFERENCES

PART 1 - GENERAL

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

Abbreviation	Company
AA	Aluminum Association Incorporated 818 Connecticut Avenue, N.W. Washington, D.C. 20006
AASHTO	American Association of State Highway and Transportation Officials 444 North Capitol Street, N.W., Suite 225 Washington, D.C. 20001
ACI	American Concrete Institute P.O. Box 19150 Detroit, MI
AEIC	Association of Edison Illuminating Companies 51 East 42nd Street New York, NY 10017
AFBMA	Anti-Friction Bearing Manufacturer's Association 60 East 42nd Street New York, NY 10017
AGA	American Gas Association 8501 East Pleasant Valley Road Cleveland, OH 44131
AGMA	American Gear Manufacturer's Association 1330 Massachusetts Avenue, N.W. Washington, D.C.
AISC	American Institute of Steel Construction 101 Park Avenue New York, NY 10017
AISI	American Iron and Steel Institute 1000 16th Street, N.W. Washington, D.C. 20036

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

Abbreviation	Company
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, NY 10017
ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103
AWPA	American Wood Preservers Association 1625 Eye Street Washington, DC 20006
AWS	American Welding Society 2501 N.W. 7th Street Miami, FL 33125
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235
CBM	Certified Ballast Manufacturers 2120 Keith Building Cleveland, OH 44115
CMAA	Crane Manufacturers Association of America, Inc. (Formerly called: Overhead Electrical Crane Institute - OECI) 1326 Freeport Road Pittsburgh, PA 15238
CRSI	Concrete Reinforcing Steel Institute 180 North La Salle Street Chicago, IL 60601
CSA	Canadian Standards Association 178 Rexdale Boulevard Rexdale, Ontario, M9W IR3, Canada
DEMA	Diesel Engine Manufacturer's Association 122 East 42nd Street New York, NY 10017
DIS	Division of Industrial Safety California Department of Industrial Relations 2422 Arden Way Sacramento, CA 95825

Abbreviation	Company
EEI	Edison Electric Institute 90 Park Avenue New York, NY 10016
EIA	Electronic Industries Association 2001 Eye Street N.W. Washington, DC 20006
EJMA	Expansion Joint Manufacturer's Association 331 Madison Avenue New York, NY 10017
ESO	Electrical Safety Orders, California Administrative Code, Title 8, Chap. 4, Subarticle 5 Office of Procurement, Publications Section P.O. Box 20191 8141 Elder Creek Road Sacramento, CA 95820
FEDSPEC	Federal Specifications General Services Administration Specification and Consumer Information Distribution Branch Washington Navy Yard, Bldg. 197 Washington, DC 20407
FEDSTDS	Federal Standards (see FEDSPECS)
FM	Factory Mutual Research 1151 Boston-Providence Turnpike Norwood, MA 02062
HEI	Heat Exchange Institute 122 East 42nd Street New York, NY 10017
HI	Hydraulic Institute 1230 Keith Building Cleveland, OH 44115
IAPMO	International Association of Plumbing and Mechanical Officials 5032 Alhambra Avenue Los Angeles, CA 90032

Abbreviation	Company
ICBO	International Conference of Building Officials 5360 South Workman Mill Road Whittier, CA 90601
ICEA	Insulated Cable Engineers Association P.O. Box P South Yarmouth, MA 02664
IEEE	Institute of Electrical and Electronics Engineers, Inc. 345 East 47th Street New York, NY 10017
IES	Illuminating Engineering Society C/O United Engineering Center 345 East 47th Street New York, NY 10017
ISA	Instrument Society of America 400 Stanwix Street Pittsburgh, PA 15222
JIC	Joint Industrial Council 7901 Westpark Drive McLean, VA 22101
MILSPEC	Military Specifications Naval Publications and Forms Center 5801 Tabor Avenue Philadelphia, PA 19120
MSS	Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. 127 Park Street, N.E. Vienna, VA 22180
NAAMM	National Association of Architectural Metal Manufacturers 100 South Marion Street Oak Park, IL 60302
NACE	National Association of Corrosion Engineers P.O. Box 986 Katy, TX 77450

Abbreviation	Company
NEC	National Electric Code National Fire Protection Association 470 Atlantic Avenue Boston, MA 02210
NEMA	National Electrical Manufacturer's Association 155 East 44th Street New York, NY 10017
NESC	National Electric Safety Code American National Standards Institute 1430 Broadway New York, NY 10018
NFPA	National Forest Products Association (Formerly called: National Lumber Manufacturer's Association) 1619 Massachusetts Avenue, N.W. Washington, DC 20036
OSHA	Occupational Safety and Health Act U.S. Department of Labor San Francisco Regional Office 450 Golden Gate Avenue, Box 36017 San Francisco, CA 94102
PPIC	The Plumbing & Piping Industry Council, Inc. Suite 402 510 Shatto Place Los Angeles, CA 90020
SAE	Society of Automotive Engineers 2 Pennsylvania Street New York, NY 10001
SAMA	Scientific Apparatus Makers Association One Thomas Circle Washington, DC 20005
SBCC	Southern Building Code Congress 1116 Brown-Marx Building Birmingham, AL 35203
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Inc. 8224 Old Courthouse Road Tysons Corner Vienna, VA 22180

Abbreviation	Company
SSPWC	Standard Specifications for Public Works Construction Building News, Inc. 3055 Overland Avenue Los Angeles, CA 90034
TEMA	Tubular Exchanger Manufacturer's Association 331 Madison Avenue New York, NY 10017
UBC	Uniform Building Code Published by ICBO
UL	Underwriters Laboratories Inc. 207 East Ohio Street Chicago, IL 60611
UMC	Uniform Mechanical Code Published by ICBO
UPC	Uniform Plumbing Code Published by IAPMO
USBR	Bureau of Reclamation U.S. Department of Interior Engineering and Research Center Denver Federal Center, Building 67 Denver, CO 80225
WWPA	Western Wood Products Association (Formerly called: West Coast Lumberman's Association - WCLA) Yeon Building Portland, CA 97204

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01100

ARCHAEOLOGICAL PROTECTION

PART 1 - GENERAL

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

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

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.1 SUBMITTALS

A. Shop drawings shall be required for:

1. Project Sign

2. Stormwater Pollution Prevention Plan

B. Other required submittals shall include:

1. Manufacturer's Data.

3. Certificates of Warranty.

4. Any others as called for in the plans, specifications, or by the Engineer.

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

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

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

CONTRACTOR NAME

PROJECT: _____

JOB NO: _____

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

DATE RECEIVED _____

SPECIFICATION SECTION _____

SPECIFICATION PARAGRAPH _____

DRAWING NUMBER _____

SUBCONTRACTOR NAME _____

SUPPLIER NAME_____

MANUFACTURER NAME _____

CERTIFIED BY: _____

C. This stamp, "filled in", should appear on the title sheet of each shop drawing, on a cover sheet of submittals in an 8-1/2" x 11" format, or on one face of a cardstock tag (min. 3" x 6") tied to each sample. The tag on the samples should state what the sample is so that, if the tag is accidentally separated from the sample, it can be matched up again. The back of this tag will be used by the Engineer for his receipt, review, and log stamp and for any comments that relate to the sample.

D. All submittals for material, equipment, and shop drawings listed in the contract documents, including dimensioned plumbing shop drawings, shall be required and shall be reviewed by the Engineer, prior to any ordering of materials and equipment.

E. Unless otherwise noted, the Contractor shall submit to the Engineer for his review eight copies of all shop drawings, piping layout, and/or catalog cuts for fabricated items and manufactured items (including mechanical and electrical equipment) required for the construction. Drawings shall be submitted in sufficient time to allow the Engineer not less than twenty regular working days for examining the drawings.

F. The drawing shall be accurate, distinct, and complete and shall contain all required information, including satisfactory identification of items, units and assemblies in relation to the contract drawings and specifications.

G. Unless otherwise approved by the Engineer, shop drawings shall be submitted only by the Contractor, who shall indicate by a signed stamp on the drawings or other approved means that the Contractor has checked the shop drawings and that the work or equipment shown is in accordance with contract requirements and has been checked for dimensions and relationship with work of all other trades involved. All deviations from the plans and specifications shall be listed. The practice of submitting incomplete or unchecked shop drawings for the Engineer to correct or finish will not be acceptable, and shop drawings which, in the opinion of the Engineer, clearly indicate that they have not been checked by the Contractor will be considered as not complying with the intent of the contract documents and will be returned to the Contractor for resubmission in the proper form.

H. When the shop drawings have been reviewed by the Engineer, two sets of submittals will be returned to the Contractor appropriately stamped. If major changes or corrections are necessary, the drawing may be rejected and one set will be returned to the Contractor with such changes or corrections indicated, and the Contractor shall correct and resubmit eight copies of the drawings, unless otherwise directed by the Engineer. No changes shall be made by the Contractor to the resubmitted shop drawings other than those changes indicated by the Engineer. The resubmittal shall be so indicated on the shop drawing.

I. The review of such drawings and catalog cuts by the Engineer shall not relieve the Contractor from responsibility for correctness of the dimensions, fabrication details, and space requirements or for deviations from the contract drawings and specifications, unless the Contractor has called attention to such deviations, in writing, by a letter accompanying the drawings and the Engineer approved the change or deviations, in writing, at the time of submission; nor shall review by the Engineer relieve the Contractor from the responsibility for errors in the shop drawings. When the Contractor does call such deviations to the attention of the Engineer, he shall state in his letter whether or not such deviations involve any deduction or extra cost adjustment.

J. The approval of the above drawings, lists, prints, specifications, or other data shall in no way release the Contractor from his responsibility for the proper fulfillment of the requirements of this contract nor for fulfilling the purpose of the installation nor from his liability to replace the same should it prove defective or fail to meet the specified requirements.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01505

MOBILIZATION AND DEMOBILIZATION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

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

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

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 GUIDELINES:

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

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

END OF SECTION

SECTION 01567

POLLUTION CONTROL

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

A. Rubbish Disposal

1. No burning of debris and/or waste materials shall be permitted on the project site.

2. No burying of debris and/or waste material except for materials which are specifically indicated elsewhere in these specifications as suitable for backfill shall be permitted on the project site.

3. All unusable debris and waste material shall be hauled away to an appropriate off-site dump area. During loading operations, debris and waste materials shall be watered down to allay dust.

4. Clean-up shall include the collection of all wastepaper 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.

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. Starting-up of construction equipment meeting allowable noise limits shall not be done prior to 6:45 a.m. without prior approval of the Engineer. Equipment exceeding allowable noise levels shall not be started-up prior to 7:00 a.m.

D. Erosion

1. During interim grading operations, the grade shall be maintained so as to preclude any damage to adjoining property from water and eroding soil.

2. Temporary berms, cut-off ditches and other provisions which may be required because of the Contractor's method of operations shall be installed at no cost to the State.

3. Instream diversion such as sandbags and barriers, shall be phased, allowing obstructions up to half of the total channel width, in order to allow bypass flow around the contained area of construction. The instream diversion shall be constructed and maintained as shown on the plans to minimize erosion and pollution of waterways during construction.

E. Others

1. Wherever trucks and/or vehicles leave the site and enter surrounding paved streets, the Contractor shall prevent any material from being carried onto the pavement. Waste water shall not be discharged into existing streams, waterways, or drainage systems such as gutters and catch basins unless treated to comply with the State Department of Health water pollution regulations.

2. Trucks hauling debris shall be covered as required by PUC Regulation. Trucks hauling fine materials shall be covered.

3. No dumping of waste concrete will be permitted at the job-site.

4. Except for rinsing of the hopper and delivery chute, and for wheel washing where required, concrete trucks shall not be cleaned on the job-site.

5. Except in an emergency, such as a mechanical breakdown, all vehicle fueling and maintenance shall be done in a designated area. A temporary berm shall be constructed around the area when runoff can cause a problem.

F. Suspension of Work

1. Violations of any of the above requirements or any other pollution control requirements which may be specified in the Technical Specifications herein shall be cause for suspension of the work creating such violation.

No additional compensation shall be due the Contractor for remedial measures to correct the offense. Also, no extension of time will be granted for delays caused by such suspensions.

2. If no corrective action is taken by the Contractor within 72 hours after a suspension is ordered by the Engineer, the State reserves the right to take whatever action is necessary to correct the situation and to deduct all costs incurred by the State in taking such action from monies due the Contractor.

3. The Engineer may also suspend any operations which he feels are creating pollution problems although they may not be in violation of the above-mentioned requirements. In this instance, the work shall be done by force account as described in Subsection 4.2b - "Additional Work" of the GENERAL CONDITIONS and paid for in accordance with Subsection 8.4b - "Force - Account Work" therein. The count of elapsed working days to be charged against the contract in this situation shall be computed in accordance with Subsection 7.18 - "Contract Time" of the GENERAL CONDITIONS.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

END OF SECTION

SECTION 01570

TEMPORARY EROSION CONTROL

PART 1 – GENERAL

1.1 SUMMARY

A. Description: Furnish all labor, materials, testing, inspection, and equipment required to complete the temporary erosion and sediment control work indicated on the Drawings and specified herein. The work includes, but is not limited to, implementing temporary erosion and sediment control measures and other storm water pollution prevention Best Management Practices (BMPs) to prevent sediment, pollutants, and construction-related waste materials from entering streams, waterways, storm drainage systems, or State waters, in conformance with the requirements of this section and the National Pollution Discharge Elimination System (NPDES) permit.

B. Related Sections:

1. Section 01300 – Submittals

2. Section 02050 – Demolition

3. Section 02200 – Earthwork

1.2 REFERENCE STANDARDS

A. The publications listed form a part of this specification to the extent referenced. All references to measurement and payment do not apply to this project.

B. County of Kauaʻi – Department of Public Works Standard Specifications (latest applicable edition).

C. State of Hawaii, Department of Health (DOH):

1. Hawaii Administrative Rules (HAR) Chapter 11-54 – Water Quality Standards.

2. HAR Chapter 11-55 – Water Pollution Control (including Appendix A and Appendix C).

3. National Pollution Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activities (DOH-CWB Form C – Notice of Intent).

D. American Society for Testing and Materials (ASTM):

1. ASTM D 4439 – Geosynthetics.

2. ASTM D 4533 – Trapezoid Tearing Strength of Geotextiles.

3. ASTM D 4632 – Grab Breaking Load and Elongation of Geotextiles.

4. ASTM D 4873 – Identification, Storage, and Handling of Geosynthetic Rolls and Samples.

5. ASTM D 5035 – Breaking Force and Elongation of Textile Fabrics (Strip Method).

1.3 PERMITS

A. The Contractor must obtain all permits required by the State of Hawaii Department of Health or other applicable State and local agencies prior to commencing work. Permits may include, but are not limited to:

1. NPDES General Permit for Construction Stormwater (DOH-CWB Form C – Notice of Intent / SWPPP): Required for construction activities disturbing one (1) or more acres of land. The Owner is in the process of obtaining the NPDES Permit for Construction Activities and it is expected to be received prior to start of construction. Coverage under the general permit (Notice of General Permit Coverage, NGPC) authorizes stormwater discharges only to receiving State waters from the project location identified in the NOI, provided the Contractor complies with HAR 11-54; HAR 11-55, Appendix A; HAR 11-55, Appendix C; and the information submitted in the NOI. Discharges of non-storm water toxics and other water pollutants to State

2. NPDES Permit for Dewatering Activities (DOH-CWB Form G): Required if dewatering activities require effluent discharge into State waters or drainage systems. The Contractor is responsible for obtaining this permit if one is required.

B. Post copies of all required permits at the project site in a conspicuous location accessible to inspectors.

C. Coordinate all DOH submittals through the Engineer.

1.4 SUBMITTALS

A. See Section 01300 – Submittals.

B. Site-Specific Best Management Practices (BMP) Plan: Submit within 30 calendar days of contract execution, and obtain written acceptance from the Engineer

before commencing any earth-disturbing activities. The Site-Specific BMP Plan is the sole responsibility of the Contractor; additional contract time will not be issued for delays due to incompleteness. The plan must include:

1. Written description of activities to minimize water pollution and soil erosion, including: identification of potential pollutants and their sources; list of all materials and heavy equipment to be used; descriptions of methods and devices to minimize pollutant discharge; maintenance and removal procedures for erosion/siltation control devices; methods of removing and disposing hazardous wastes; methods for removing concrete/asphalt cutting slurry, concrete curing water, and hydrodemolition water; Spill Control and Prevention and Emergency Spill Response Plan; fugitive dust control measures; methods for storing and handling oils, paints, and other products; material storage and staging areas; concrete truck washouts and concrete waste control; fueling and equipment maintenance; tracking of sediment offsite; litter management; toilet facilities; and other factors that may cause water pollution, dust, or erosion.

2. Plans indicating locations of BMP devices; areas of soil disturbance in cut and fill; construction staging and storage areas; areas where vegetative practices are to be implemented; intended drainage patterns with flow arrows; and separate drawings for each phase of construction that alters drainage patterns. Indicate approximate dates for device installation and removal.

3. Construction schedule.

4. Name(s) of specific individual(s) designated responsible for water pollution, dust, and erosion controls on the project site, including home, cellular, and business telephone numbers, fax numbers, and e-mail addresses.

5. Description of fill material to be used.

6. For projects with an NPDES Permit for Construction Activities: information to address all sections of the Storm Water Pollution Prevention Plan (SWPPP), as required by HAR 11-55, Appendix C. Include the Site-Specific BMP Review Checklist, downloadable from http://stormwaterhawaii.com.

C. Pre-Construction Meeting: Schedule a water pollution, dust, and erosion control meeting with the Engineer after the Site-Specific BMP Plan is accepted in writing. The meeting must be scheduled a minimum of 14 calendar days prior to the issuance of Notice to Proceed.

D. Manufacturer's Certificates of Conformance: Submit manufacturer's certificates of conformance for each type of temporary erosion and sediment control product prior to delivery.

E. Solid Waste Disclosure Form: Submit to the DOH, Solid and Hazardous Waste Branch, Solid Waste Section, at least 30 calendar days before the start of construction activities. Provide a copy to the Engineer upon submission. Provide copies of all disposal receipts from DOH-permitted facilities monthly.

F. Rain Gage Data Logs: Submit to the Engineer weekly.

G. Inspection Reports: Submit to the Engineer within 24 hours of each inspection.

H. SWPPP Updates: Provide copies of revised SWPPP to the Engineer within seven (7) calendar days of any changes.

1.5 GENERAL REQUIREMENTS

A. The Contractor must comply with all applicable Federal and State laws, including the latest DOH regulations, and all local laws and regulations concerning pollution control and abatement.

B. The Contractor is responsible for complying with all terms of the State of Hawaii, Department of Health's NPDES permit and must employ any or all BMPs described in this specification, the Erosion and Sediment Control Plan (ECP), and the Site-Specific BMP Plan, as necessary to ensure compliance with applicable regulations. Any fines or citations issued by the DOH resulting directly or indirectly from the Contractor's failure to comply shall be the full and complete responsibility of the Contractor.

C. Compliance with the provisions of this section by subcontractors is the responsibility of the Contractor.

D. Noncompliance: The Engineer will notify the Contractor in writing of any noncompliance with the foregoing provisions and the action to be taken. After receipt of such notice, the Contractor must immediately take corrective action. If the Contractor fails or refuses to comply promptly, the Engineer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to any such stop orders shall be the basis for a claim for extension of time or for excess costs or damages.

E. Do not commence site clearing or earth-disturbing operations until temporary erosion and sedimentation controls are in place and accepted in writing by the Engineer.

PART 2 – PRODUCTS

2.1 GENERAL

A. Materials must be as specified in Section 209 – Temporary Water Pollution, Dust, and Erosion Control of the Hawaii Standard Specifications, and as amended by this specification. Materials must also comply with the requirements of this section.

B. Alternative materials or methods to control, prevent, remove, and dispose of pollutants are allowable if acceptable to the Engineer.

2.2 COMPOST FILTER SOCKS

A. Compost Filtration Media: Use sanitized, mature compost that meets all applicable local, State, and Federal quality requirements. Biosolids compost must meet the Standards for Class A biosolids outlined in 40 CFR Part 503. Compost filter media must meet the following criteria:

Parameters	Units of Measure	Vegetated Filter Sock	Unvegetated Filter Sock
pH	pH units	5.0 – 8.5	6 – 8
Soluble Salt Concentration (electrical conductivity)	dS/m (mmhos/cm)	Maximum 5	Not applicable
Moisture Content	%, wet weight basis	30 – 60	30 – 60
Organic Matter Content	%, dry weight basis	25 – 65	25 – 65
Particle Size	% passing selected mesh, dry weight basis	3 in. = 100% 1 in. = 90–100% 0.75 in. = 70–100% 0.25 in. = 30–75% Max length = 6 in. Avoid <30% fine particles No more than 60% passing 0.25 in. sieve in high rainfall situations	2 in. = 100% 0.375 in. = 10–30%
Stability (Carbon Dioxide Rate)	mg CO_2-C per gram organic matter per day	<8	(same as vegetated)
Physical Contaminants (manmade inerts)	%, dry weight basis	<1	<1

B. Filter Sock Construction: Filter socks must be manufactured from 5-mil-thick continuous HDPE filament, woven into a tubular mesh netting with net openings

of 3/8 inch. Filter socks must be filled with compost or approved alternate organic filter media meeting the criteria above.

1. Standard diameter: 12 inches. On slopes steeper than 3:1, install 18-inch-diameter filter socks or larger. Submit a 2-pound sample of the filtering media to the Engineer for approval.

2. Compost filter socks must be BioSock as manufactured by EnviroTech BioSolutions, Filtrexx, or approved equal.

3. Alternatively, install as 9-inch, 12-inch, or 18-inch nominal diameters as indicated on the project Drawings or as specified by the Engineer.

C. Alternate Organic Filter Media: Non-composted organic materials may be utilized where only sediment removal and hydraulic flow-through conditions are required. Acceptable organic filter media include untreated and non-painted wood pallets, land clearing debris, or tree chips. Filter media must be weed-free and derived from a clean, separated source of organic matter. Submit a sample to the Engineer for approval.

D. Wood Anchor Stakes: Nominal 3/4 by 3/4 inch, minimum 16 inches long. Do not use rebar or other metal rods.

E. Earth Anchors: Aluminum, with aircraft-grade galvanized wire rope tendon. Holding capacity in normal soils: 600 pounds; ultimate capacity: 1,160 pounds per assembly. Earth anchors must be SockAnchor as manufactured by EnviroTech BioSolutions, or approved equal.

PART 3 – EXECUTION

3.1 BMP IMPLEMENTATION

A. Construct temporary erosion and sediment control in conformance with Section 209 of the Hawaii Standard Specifications, as amended herein.

B. Site-Specific BMP measures must be in place, functional, and accepted by the Engineer prior to initiating any ground-disturbing activities. Do not begin work until submittals specified in Section 1.04 are completed and accepted in writing.

C. Limit the maximum surface area of earth material exposed at any one time to 300,000 square feet. Protect temporarily or permanently disturbed soil surfaces from rainfall impact, runoff, and wind before the end of the work day.

D. Install, maintain, monitor, repair, and replace Site-Specific BMP measures throughout the duration of construction and post-construction as required by this section and permit conditions.

E. Modify and resubmit the Site-Specific BMP Plan whenever project conditions change during construction that were unforeseen during design or pre-construction stages. Modifications must be accepted in writing by the Engineer prior to implementation.

F. Burnoff of ground cover is not permitted.

3.2 INSTALLATION – COMPOST FILTER SOCKS

A. Install compost filter socks per manufacturer's recommendations. Installation personnel are required to satisfactorily complete manufacturer training prior to installation. Provide evidence of training upon request of the Engineer.

B. Install as a perimeter control, inlet protection, and stockpile containment as indicated on the Drawings and per manufacturer's recommendations. Ensure filter socks are properly installed to effectively retain sediment immediately after completing each phase of earth-disturbing work.

C. Remove sediment when accumulation reaches three-quarters of the barrier height. Incorporate removed sediment in the project at designated locations or dispose of properly.

D. Remove compost filter socks upon written approval by the Engineer.

3.3 MAINTENANCE

A. Maintain temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections, restoring destroyed vegetative cover, and repairing control measures promptly.

B. Diversion Dike Maintenance: Inspect per 3.11 below. Repair damaged diversion dikes promptly. Remove and grade to an acceptable slope when no longer required; seed areas disturbed by removal.

C. The Contractor's designated representative must address any Site-Specific BMP deficiencies brought up by the Engineer immediately, including weekends and holidays. Complete work to fix deficiencies by the close of the next work day if the problem does not require significant repair, or within seven (7) calendar days when installation of a new pollution prevention control or significant repair is needed. Notify the Engineer and document why it is infeasible to complete within seven calendar days and complete the work as soon as practicable.

3.4 INSPECTIONS

A. General: The Contractor must inspect disturbed areas, areas used for storage of materials exposed to precipitation that have not been finally stabilized, all BMP measures, and areas where vehicles exit the site at least once every seven (7)

calendar days and within 24 hours of the end of any storm that produces 0.5 inch or more of rainfall at the site. Where sites have been finally stabilized, conduct inspections at least once per month.

B. For projects with an NPDES Permit for Construction Activities – areas discharging into nutrient or sediment-impaired waters: inspect, prepare a written report, and make repairs to BMP measures (a) weekly, (b) within 24 hours of any rainfall of 0.25 inch or greater in a 24-hour period, and (c) when existing erosion control measures are damaged or not operating properly.

C. Inspection Details: Inspect disturbed areas and material storage areas for evidence of, or potential for, pollutants entering the drainage system. Observe erosion and sediment control measures to ensure they are operating correctly. Inspect discharge locations to ascertain whether measures are effective in preventing significant impacts to receiving waters. Inspect vehicle exit locations for evidence of offsite sediment tracking.

D. Inspection Reports: The Contractor must develop an Inspection Checklist based on site-specific BMPs, including a list of structural practices, maintenance performed, and action taken. For each inspection, prepare a report summarizing: scope of inspection; name(s) and qualifications of personnel; date(s) of inspection; major observations; and the inspection checklist. Submit the report to the Engineer within 24 hours of inspection. Maintain a copy of each inspection report on the job site. Maintain continuous records for the duration of the project.

3.5 REMOVAL AND FINAL CLEAN-UP

A. Remove all temporary erosion and sediment controls after permanent vegetation is established and the potential for erosion has passed, upon written approval by the Engineer. Final removal of all BMP barriers requires written approval before removal.

B. Upon removal of temporary controls, grade and restore all disturbed areas to match adjacent ground surface contours. Reestablish permanent vegetation on all disturbed areas.

C. Submit the Notice of Termination (NOT) to the DOH-CWB upon project completion and final stabilization, as required by the NPDES permit.

APPENDIX A – POTENTIAL POLLUTANT SOURCES AND CORRESPONDING SITE-SPECIFIC BMPS

The following table identifies potential pollutant sources and corresponding BMPs used to mitigate the pollutants. Each BMP is referenced to the corresponding section of the current HDOT Construction Best Management Practices Field Manual or appropriate supplemental sheets, available at http://www.stormwaterhawaii.com/resources/contractors-and-consultants/.

Pollutant Source	Key BMPs to Implement	BMP Reference
Construction debris, green waste, general litter	Separate C&D wastes; provide waste containers; inspect and schedule waste collection regularly; do not allow containers to overflow; provide storm drain inlet protection.	See Solid Waste Management SM-6; Storm Drain Inlet Protection SC-2; Perimeter Sediment Controls.
Equipment operation/maintenance (oil, fuel, hydraulic fluid)	Use off-site wash/maintenance facilities when practical; place drip pans under equipment; provide spill cleanup materials; clean spills immediately using dry methods; inspect vehicles regularly; store fuels in secondary containment.	See Vehicle/Equipment Cleaning SM-11, Maintenance SM-12, Refueling SM-13; Material Delivery SM-2; Spill Prevention SM-10.
Soil erosion from disturbed areas	Provide soil stabilization, slope protection, storm drain inlet protection, perimeter controls and sediment barriers, sediment basins, check dams, level spreaders; minimize steep slope disturbance; install velocity dissipation devices in temporary drains/swales; delineate natural buffer areas.	See Soil Stabilization (EC-5 Seeding, EC-6 Mulching, EC-7 Geotextiles); Slope Protection (EC-9); SC-1 Silt Fence; SC-2 Storm Drain Inlet Protection; SC-8 Compost Filter Berm; SC-15/16 Sediment Trap/Basin; EC-2 Construction Road Stabilization; SM-14 Scheduling; SM-16 Preservation of Existing Vegetation.
Sediment from soil stockpiles	Locate stockpiles ≥50 feet from concentrated runoff or natural buffers; place bagged materials on pallets under cover; provide physical diversion and cover; place silt fence/fiber rolls around stockpiles; do not hose sediment into storm drains.	See Protection of Stockpiles SM-4; Storm Drain Inlet Protection SC-2; Perimeter Sediment Controls.

Pollutant Source	Key BMPs to Implement	BMP Reference
Emulsified asphalt / prime/tack coat	Restrict paving in wet weather; use asphalt emulsions; protect drain inlets/manholes during application; keep drip pans on site; inspect inlet protection devices.	See Material Delivery SM-2; Paving Operations SM-19; Storm Drain Inlet Protection SC-2.
Paint and paint wash solvents	Store chemicals in labeled original containers; collect washwater in leak-proof containers; direct water-based paint rinse to sanitary sewer where possible; filter/reuse solvents; dispose of oil-based paints as hazardous waste; locate wash area ≥50 feet from storm drains.	See Material Delivery SM-2; Material Use SM-3; Hazardous Waste Management SM-9; Spill Prevention SM-10; Structure Construction and Painting SM-20.
Industrial chemicals, fertilizers, and pesticides	Store in labeled original containers with secondary containment; clean spills immediately by dry methods; restrict pesticide prep to current application needs; do not apply during or before rain; follow manufacturer's instructions; dispose of hazardous waste by licensed hauler.	See Material Delivery SM-2; Material Use SM-3; Hazardous Waste Management SM-9; Spill Prevention SM-10.
Hazardous waste (batteries, solvents, treated lumber)	Do not dispose of toxic materials in construction dumpsters; segregate and recycle vehicle/equipment fluids; store in sealed labeled containers; provide secondary containment; clean spills immediately by dry methods; dispose by licensed hazardous waste hauler.	See Hazardous Waste Management SM-9; Vehicle/Equipment Maintenance SM-12.
Concrete truck wash water	Prohibit disposal by percolation; wash concrete-coated vehicles off-site or in designated wash area ≥50 feet from storm drains; contain wash water in a lined temporary pit; allow to evaporate or collect in washout bin; do not dump liquid wastes into storm drains.	See Concrete Waste Management SM-5.
Dust control water	Do not over-spray; apply only as conditions require; do not wash	See Dust Control SM-18.

Pollutant Source	Key BMPs to Implement	BMP Reference
	debris/dirt into drainage, sewage systems, or State waters.	
Saw-cutting slurry	Remove slurry by vacuuming; provide storm drain protection during saw cutting; provide Storm Drain Inlet Protection and Perimeter Sediment Controls.	See Paving Operations SM-19; Storm Drain Inlet Protection SC-2.
Concrete curing water	Avoid overspraying of curing compounds; apply only enough compound to cover surface without runoff.	See California Stormwater BMP Handbook NS-12 Concrete Curing at stormwaterhawaii.com.
Hydrotesting effluent	Obtain NPDES Permit Form F from DOH-CWB at least 30 calendar days prior to start of hydrotesting if discharging to State waters or drainage systems.	Site-Specific BMPs included in NOI/NPDES Form F submittal.
Dewatering effluent	Obtain NPDES Permit Form G from DOH-CWB at least 30 calendar days prior to start of dewatering if discharging to State waters or drainage systems.	See Dewatering Operations SM-17; NOI/NPDES Form G submittal.
Sanitary/septic waste	Locate portable toilets away from drainage facilities; secure against tipping; do not discharge wastewater to ground; use licensed service provider; schedule regular waste collection by licensed transporter.	See Sanitary/Septic Waste SM-7.
Sediment track-out	Include stabilized construction entrance at all paved road exits; restrict traffic to designated exit points; remove tracked sediment by end of same day; do not wash streets into storm drainage.	See Stabilized Construction Entrance EC-2.

END OF SECTION

SECTION 01581

PROJECT SIGN

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

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

1.2 SUBMITTAL

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

1.3 LETTER STYLE

Copy is centered and set in Adobe Type Futura Heavy. If this specific type is not available, Futura Demi Bold may be substituted. Copy should be set and spaced by a professional typesetter and enlarged photographically for photo stencil screen process.

1.4 ART WORK

Constant elements of the sign layout - frame, outline, stripe, and official state information - may be duplicated following drawing measurements, or be reproduced and enlarged photographically using a layout template if provided. The "STATE OF HAWAII" masthead should be reproduced and enlarged as specified, using the artwork provided.

1.5 TITLES

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

Design should follow the example on page 01581-3.

PART 2 - PRODUCTS

2.1 MATERIALS

A. LUMBER

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

B. PAINTS & INKS

Screen print inks are matte finish. Paints are satin finish, exterior grade. References to Ameritone Color Key Paint are for color match only.

COLOR:	1.	1BL10A	Bohemian Blue
	2.	2H16P	Softly (White)
	3.	2VR2A	Hot Tango (Red)
	4.	1M52E	Tokay (Gray)

C. CONCRETE

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

PART 3 - EXECUTION

3.1 GENERAL

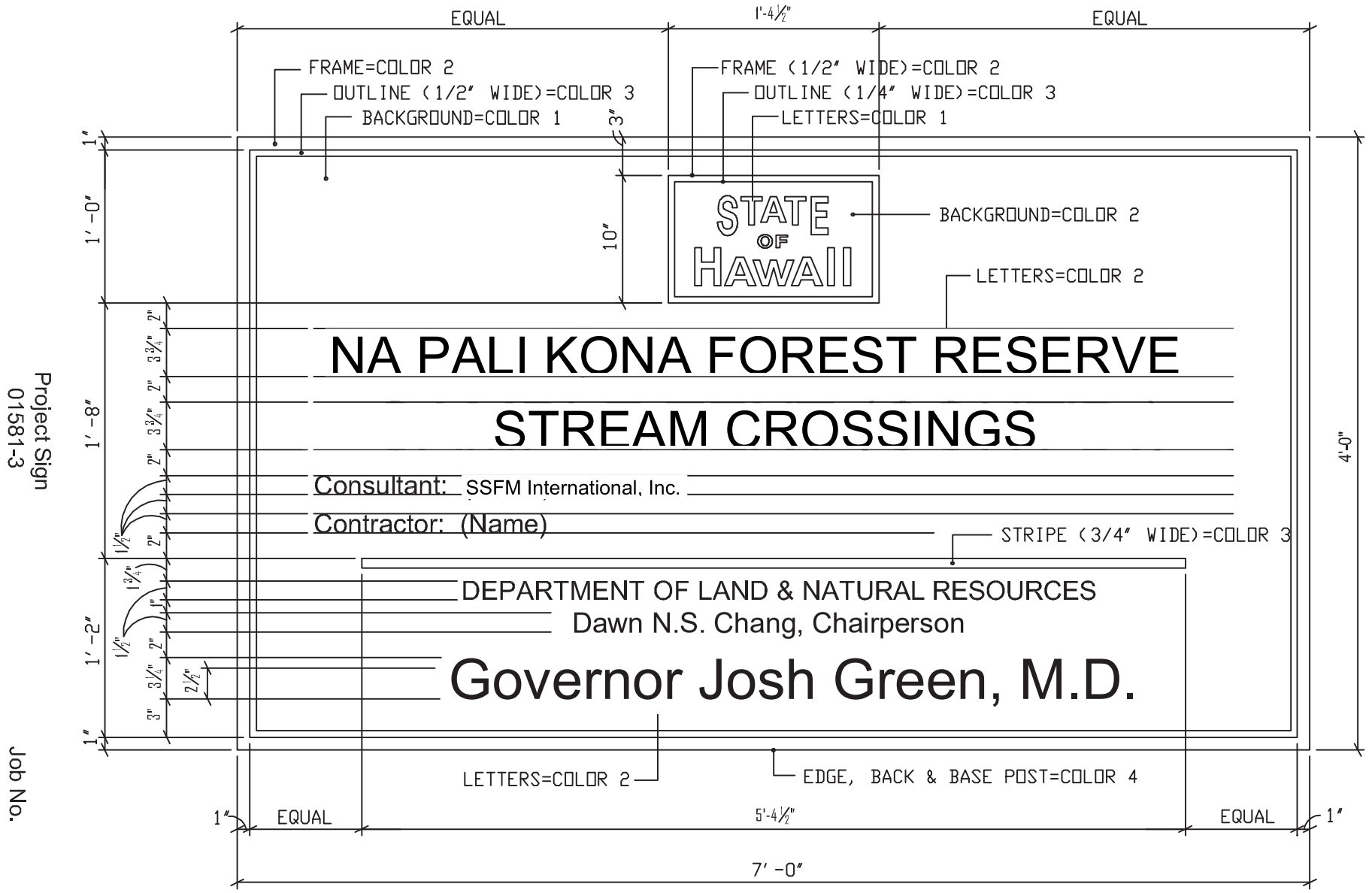
A. The Project Sign shall be constructed with new materials as specified above.

B. The Project sign shall be installed at the location indicated on the drawings or as designated by the Engineer. The project sign shall be erected upon commencement of work.

3.2 MEASUREMENTS AND PAYMENT

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

END OF SECTION

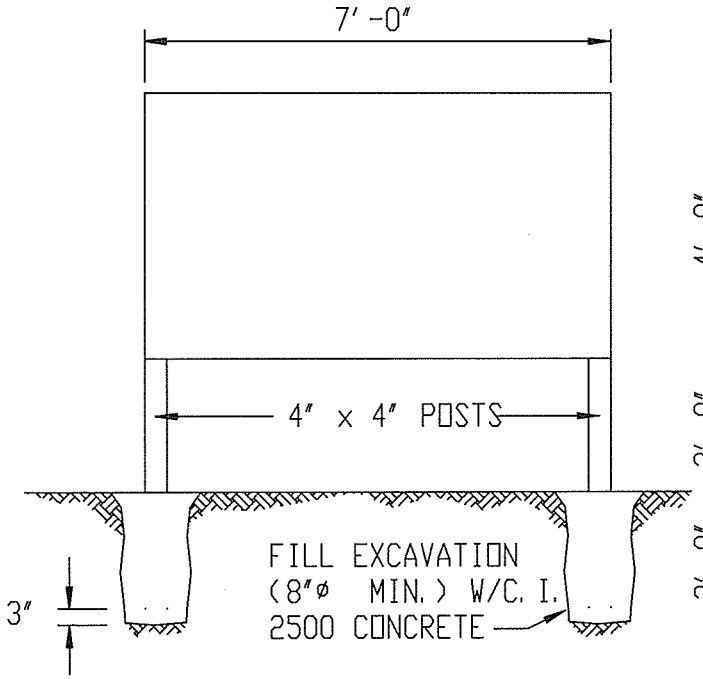


Project Sign
01581-3

Job No.

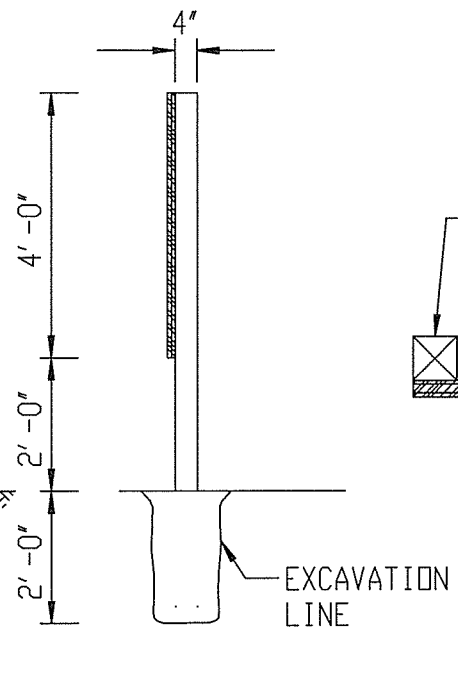
NOTE: Number of signs required 1

Project Sign
01581-4



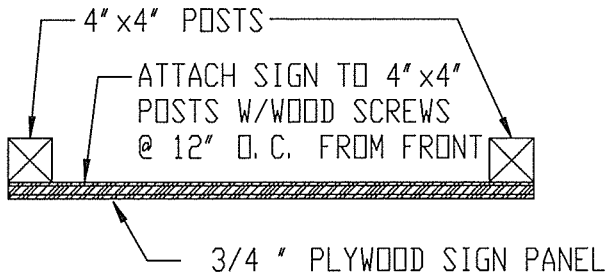
FRONT ELEVATION

NOT TO SCALE



SIDE ELEVATION

NOT TO SCALE



PLAN

NOT TO SCALE

SECTION 02050

DEMOLITION

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS: The work includes demolition and removal as indicated in the plans or specified herein. All materials resulting from demolition work, except as indicated or specified otherwise, shall become the property of the Contractor and shall be removed from the limits of Government property. Remove rubbish and debris from the job site daily, unless otherwise directed. Store materials which cannot be removed daily in areas specified by the Engineer. The Contractor shall pay for all necessary permits and certificates that may be required in connection with this work.

1.2 SUBMITTALS: Submit proposed demolition and removal procedures to the Engineer for approval before work is started. Procedures shall provide for coordination with other work in progress and a detailed description of methods and equipment to be used for each operation, and sequence of operations.

1.3 DUST CONTROL: Take appropriate action to check the spread of dust to the surrounding area and to avoid the creation of a nuisance in the surrounding area. Do not use water if it results in hazardous or objectionable conditions, such as flooding or pollution. Comply with all dust regulations imposed by local air pollution agencies.

1.4 PROTECTION

A. Existing Improvements: Protect existing improvements that are to remain in place, that are to be reused, or that is to remain the property of the Engineer by temporary covers, shoring, bracing, and supports. Repair items damaged during performance of the work or replace with new to the satisfaction of the Engineer. Do not overload structural elements. Provide new supports or reinforcement for existing construction weakened by demolition, removal, and relocation work. Construction equipment and vehicles shall neither be permitted on, nor shall be stored on the existing work that is to remain in place.

B. Trees: Protect trees within the project site which might be damaged during the demolition work.

C. Public Safety: Where pedestrian and driver safety is endangered in the work or storage areas, use traffic barricades with flashing lights. Notify the Engineer prior to beginning any such work. The Contractor shall conduct operations with minimum interference to streets, driveways, sidewalks, and passageways, etc..

D. Explosives: Use of explosives will not be permitted.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EXISTING FACILITIES

A. The existence of active utility lines transversing the construction area other than those indicated is not definitely known. Should any be encountered, the Contractor shall not disconnect same without authorization of the Engineer, but shall inform the latter immediately of each discovery, and shall follow his instructions.

3.2 SAFETY

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

3.3 DISPOSITION OF MATERIALS

A. Title to Materials: Title to all materials and equipment to be removed, except as specified otherwise, is vested in the Contractor upon receipt of notice to proceed. The Engineer will not be responsible for the condition or loss of, or damage to, such property after notice to proceed. Materials and equipment shall not be viewed by prospective purchasers or sold on the site. Burning or burying of materials on the site will not be permitted.

B. When removing the materials from the property, truck loads shall be trimmed and loaded as to prevent spillage.

3.4 CLEANUP

A. Debris and Rubbish: Remove and transport debris and rubbish in a manner that will prevent spillage into ocean or adjacent areas. Cleanup spillage from ocean and adjacent areas. The Contractor shall leave the premises clean, neat, and orderly.

B. Regulations: Comply with Federal, State, and Local hauling and disposal regulations.

END OF SECTION

SECTION 02200

EARTHWORK

PART 1 – GENERAL

1.1 SUMMARY

A. Work includes furnishing all labor, materials, equipment, and incidentals necessary for excavation, backfilling, filling, grading, hauling, moisture conditioning, compaction, and related operations required for construction of the stream crossings as shown on the Drawings.

1.2 REFERENCE STANDARDS

A. Published specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to the work of this section where cited by the abbreviations noted below. All references to measurement and payment do not apply to this project.

1. American Society for Testing and Materials (ASTM):

   a. ASTM D1557 – Standard Test Methods for Moisture-Density Relations of Soils and Soil Aggregate Mixtures using 10-lb (4.5 kg) Hammer and 18-inch (457 mm) Drop.

   b. ASTM D1883 – Standard Test Method for CBR (California Bearing Ratio) of Laboratory-Compacted Soils

   c. ASTM D4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles

2. 2005 State of Hawaii, Department of Transportation Standard Specifications & Special Provisions

1.3 RELATED SECTIONS

A. Section 01300 – Submittals

B. Section 01570 – Temporary Erosion Control

C. Section 02215 – Ditch and Channel Excavation

1.4 PROTECTIVE MEASURES

A. All excavation must be protected and guarded against danger to life, limb, and property.

B. Shoring, as required to safely preserve the excavations and earth banks, free from damages resulting from the work, must be provided and installed by the Contractor.

C. All excavations must be kept free from standing water. Contractor must perform all pumping and draining necessary to remove water to the extent required to carrying on the work.

1.5 SUBMITTALS

A. See Section 01300 – Submittals

B. Material Test Reports: Submit two (2) copies of the Gradation Analysis, California Bearing Ratio value, and swell test results to the Engineer for review before bringing material on site.

C. Field Test Reports: Submit two (2) copies of field density test results as per ASTM D1557 to the Engineer the next working day after the tests are taken.

D. Submit gradation and certifications for bedding and pipe cushion materials, and intermediate backfill from the Contractor's Soils Engineer.

E. Submit the manufacturer's literature on filter fabric to be used in the work.

1.6 QUALITY ASSURANCE

A. An independent Soils Engineer must be retained by the Contractor to observe work performance in connection with excavating, filling, backfilling, and grading, and perform Modified Proctor compaction and CBR tests.

1. The Soils Engineer must be a professional engineer experienced in soil mechanics, licensed in the State of Hawaii, and experienced in the field of geotechnical engineering, or a qualified representative. The Soils Engineer must be independent of the Contractor's firm and must be accepted by the Engineer prior to conducting any earthwork on the project.

2. Field density and compaction testing must be performed as determined by the Soils Engineer or directed by the Engineer. At a minimum, field density testing of fills, backfills, subbase, and base course must be performed for each 50 cubic yards of fill or fraction thereof. Field density testing of subgrade in cut areas must be performed at a minimum for every 250 square yards or a fraction thereof.

3. The Soils Engineer must be granted unrestricted access to the earthwork and paving operations for the purpose of conducting observations, performing testing, and securing samples.

4. All soils tests must show compliance with the specifications before the Contractor may proceed with placing additional layers of fill, backfill, topsoil, cushion fill, or base course. The Soils Engineer must test all pavement subgrades prior to subbase course placement. Two (2) copies of all test results must be provided to the Engineer.

5. Placement and compaction of the base course must be observed and tested by the Soils Engineer for compliance with the specification.

B. The Contractor must comply with applicable noise and grading ordinances and regulations, must maintain adequate erosion control measures, and must obtain all required permits.

1.7 PERMITS

A. The Contractor must procure and pay for all necessary permits or certificates that may be required in connection with this work.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Review and Acceptance: Fill material must be subject to review and acceptance by the Contractor's Soils Engineer and the Engineer.

B. Testing: Representative samples of fill material must be tested by the Contractor's Soils Engineer to determine the maximum density, optimum moisture content, CBR value, CBR swell, and soil classification. Samples from each source of borrow material and onsite excavation materials to be used as fill must be tested to prove the quality of the material.

C. Asbestos Prohibition: No asbestos containing materials may be used under this section. The Contractor must ensure that all materials incorporated in the project are asbestos-free.

D. Onsite Fill Material: Onsite clayey silt, weathered gravel, and highly to completely weathered basalt (weathered gravel with silt and sand) may be reused in compacted fills and backfills, provided all rock fragments larger than 6 inches in maximum dimension are removed prior to use.

E. Imported Fill Material: Imported structural fill must be well-graded, non-expansive granular material. Specifications for imported granular structural fill must indicate a maximum particle size of 3 inches and require that between 8 and 20 percent of the soil by weight pass the No. 200 sieve. In addition, the plasticity index (PI) of the portion of soil passing the No. 40 sieve must not exceed 10. Imported structural fill must have a CBR value of 15 percent when tested in accordance with ASTM D1883.

F. Filter Fabric: Filter fabric used beneath riprap and aggregate drainage layers must be a non-woven geotextile manufactured for soil drainage applications. The fabric must have a minimum grab tensile strength of 250 pounds and an elongation at break of 15 percent when tested in accordance with ASTM D4632.

G. Other Materials: All other materials not specified herein must be as specified in the 2005 State of Hawaii, Department of Transportation Standard Specifications.

PART 3 – EXECUTION

3.1 GENERAL

A. Protection:

1. Inspection: Examine the areas and conditions under which excavating, backfilling, and compacting for earthwork are to be performed. If any condition is found unsuitable, no work may proceed until the unsatisfactory conditions have been corrected and are acceptable to the Engineer. Proceeding with the work will constitute acceptance of existing conditions by the Contractor.

2. Erosion and sediment control is the responsibility of the Contractor, who must comply with all local laws and regulations regarding the discharge of sediment from the project site.

    a. As construction progresses and seasonal conditions change, additional erosion and sediment control measures may be required to ensure complete sediment containment. The Contractor is responsible for addressing any new conditions created by construction activities and must provide additional erosion and sediment controls beyond the minimum requirements shown on the Drawings.

    b. Temporary sediment traps and all temporary siltation controls must be maintained in satisfactory condition until clearing, earthwork, and topsoiling are completed, permanent drainage facilities are operational, and the potential for erosion has passed.

B. Control of Water Accumulation:

1. Perform operations in a manner that continuously allows positive drainage of surface runoff and prevents accumulation of water potentially causing soft areas or impede work. Before leaving after each workday, perform any operations necessary to minimize possible damage or delays caused by rain.

2. Keep excavations free of standing water; pump or drain as required. The following procedures must be used when dewatering excavations.

   a. Remove all water, including rainwater, encountered during the course of the work by use of pumps, drains, and other accepted methods. Discharge collected water to an onsite area that will not result in erosion, creation, or a nuisance in off-site areas or surface water course pollution. Obtain required permits for any water that will be discharged off-site.

   b. Prevent surface water from running into the construction areas and provide temporary dams, curbs, and ditches as may be required.

C. Stockpile Sites:

1. Where existing materials are to be stockpiled or new materials temporarily stored on site before placement, store materials only at locations shown on the approved staging area plan. Contractor is responsible for the design and construction of all required measures to protect stockpile sites and for obtaining required permits for stockpiling activities.

2. No soil will be stockpiled within tree root zones.

3.2 PREPARATION

A. The project site must be cleared of all vegetation, concrete slabs, boulders, and other deleterious material. In areas requiring fill placement, the existing ground must first be scarified to a minimum depth of 6 inches and compacted to a minimum 90 percent compaction as determined by ASTM D1557. Soft or loose soils, including areas exhibiting pumping, must be removed and replaced with approved onsite material or imported granular structural fill.

B. The use of woven geotextile filter fabrics and/or geogrids may be required to stabilize the subgrade.

3.3 GRADING

A. Grade all subgrade areas to true, even surfaces that conform to slopes and grades indicated. Make proper allowances for base course and paving thicknesses. Grade to uniform levels or slopes between points where grades are shown, and round surfaces at abrupt changes of level.

3.4 EXCAVATION

A. The Contractor must verify all existing grades, contours, lines, levels, and elevations indicated on the plans before any clearing, excavation, or construction begins. If any discrepancies are discovered in the dimensions shown on the plans, the Contractor must notify the Engineer for direction before proceeding with the

work; otherwise, the Contractor will be responsible for any costs associated with correcting construction placed based on such discrepancies.

B. Based on exploratory borings, excavations into the gravel, cobbles, and highly to completely weathered basalt can likely be accomplished using conventional excavating equipment. Hydraulic hoe-ramming equipment may be required for excavation into hard basalt or for breaking up large boulders. Considerable sloughing may occur due to the presence of cobbles and boulders in the stream beds. Temporary cuts into surface soils must be stable at slope gradients of 1.5H:1V or flatter. The Contractor is responsible for complying with all OSHA safety standards for excavations.

C. Excavate to the contours, elevations, and dimensions indicated. Keep excavations free of water. Excavate and remove any soil that is disturbed or weakened by the Contractor's operations, as well as soils softened or rendered unsuitable for subsequent construction due to weather exposure. Refill such areas with select granular structural fill material and compact to 95 percent of maximum dry density per ASTM D1557. Unless otherwise specified, excavations cut below the indicated depth must be refilled with select granular material and compacted to 95 percent of ASTM D1557 maximum dry density within new or existing building and vehicle load-bearing areas.

D. All material encountered in excavation and determined to be unsuitable by the Engineer must be removed from the site.

E. All base course fill and structural fill work must be done in the presence of the Engineer or a Soils Engineer and approved prior to commencement with foundation work.

F. Jetting and ponding of the backfill or fill materials are not permitted.

G. Do not place fill or backfill during unfavorable weather conditions.

3.5 FILLING AND BACKFILLING

A. Fill and backfill to contours, elevations, and dimensions indicated. Compact each lift before placing overlying lift. Key fill into subgrades where indicated.

1. General Fill: Construct fill slopes from the bottom up. Filling the slope with sliver fills is not allowed. Continually bench fill into existing slopes as fill is brought up in lifts. Extend benches into competent material with widths wide enough for compaction equipment to work effectively. Construct fill slopes by overfilling and cutting back to the design slope gradient to obtain a well-compacted slope face.

2. All slopes must be planted as soon as practicable upon completion of grading to reduce the effects of erosion and weathering.

B. Compaction: Place fill and backfill consisting of cohesive soils, such as the onsite clayey silt in horizontal lifts restricted to 8 inches in loose thickness and compacted to a minimum 90 percent compaction as determined by ASTM D 1557. Also place granular fill, such as the weathered gravel and imported granular structural fill in 8-inch loose lifts but compacted to at least 95% compaction as determined by ASTM D1557.

C. Excavation: Fill placed in areas which slope steeper than 5H:1V must be continually benched as the fill is brought up in lifts.

3.6 GRADING TOLERANCES

A. Spread, moisten, and compact the material to the required subgrade elevations, with a maximum deviation of 0.10 feet above or below the required level.

3.7 FINAL INSPECTION

A. At the time of final inspection of the work performed under the Contract, covered by this section must be complete in every respect.

B. All surplus materials of every character resulting from the work of this section must have been removed.

C. Any defects discovered in the work subsequent to this inspection must be corrected prior to final acceptance.

END OF SECTION

SECTION 02215

DITCH AND CHANNEL EXCAVATION

PART 1 – GENERAL

1.1 SUMMARY

A. Description: Furnish all labor, materials, equipment, testing, and incidentals required to complete ditch and channel excavation, including new construction and reconstruction of open ditches, drainage channels, irrigation channels, swales, and related appurtenances, as shown on the Drawings and specified herein.

B. The work includes, but is not limited to:

1. Reconstruction, realignment, or modification of existing ditches and channels.

2. Shaping and finishing of ditch and channel bottoms and side slopes.

3. Placement of riprap, rock, or other channel lining materials for erosion protection.

4. Dewatering as necessary to perform the work.

5. Disposal of excavated materials.

6. Temporary diversion of existing flows during construction.

C. Related Sections:

1. Section 01300 – Submittals

2. Section 01570 – Temporary Erosion and Sediment Control

3. Section 02200 – Earthwork

4. Section 03300 – Cast-in-Place Concrete

1.2 REFERENCE STANDARDS

A. Published specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to the work of this section where cited by the abbreviations noted below. All references to measurement and payment do not apply to this project.

B. State of Hawaii, Department of Health (DOH):

1. Hawaii Administrative Rules (HAR) Chapter 11-54 – Water Quality Standards.

2. HAR Chapter 11-55 – Water Pollution Control.

3. National Pollution Discharge Elimination System (NPDES) General Permit for Storm Water Discharges Associated with Construction Activities.

C. State of Hawaii, Department of Land and Natural Resources (DLNR):

1. Hawaii Revised Statutes (HRS) Chapter 174C – Hawaii Water Code. Stream Channel Alteration Permit required for work within or adjacent to streams or watercourses.

2. HAR Chapter 13-169 – Stream Channel Alteration Permits (SCAP). A permit from DLNR is required before any alteration of the bank, bed, or channel of a stream, river, or drainage ditch that is a watercourse of the State.

D. U.S. Army Corps of Engineers – Section 404 of the Clean Water Act. A Department of the Army Permit may be required for discharge of dredged or fill material into waters of the United States, including streams, wetlands, and other jurisdictional waters.

E. U.S. Environmental Protection Agency (EPA) – Section 402 NPDES permit requirements where applicable.

F. American Society for Testing and Materials (ASTM):

1. ASTM D1557 – Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.

2. ASTM D6938 – Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods.

1.3 SUBMITTALS

A. See Section 01300 – Submittals.

B. Construction Dewatering Plan: Prior to commencement of work, submit a plan describing dewatering methods, discharge points, and measures to prevent sedimentation and erosion of the ditch or channel and adjacent areas. Comply with NPDES permit conditions and DOH HAR Chapters 11-54 and 11-55.

C. Temporary Flow Diversion Plan: Submit a plan for diverting existing flows during construction to maintain drainage or irrigation service without interruption, where required. Obtain approval from the Engineer prior to implementation.

D. Riprap/Channel Lining Material Certifications: Submit manufacturer's or supplier's certifications and gradation test results for riprap, rock, or other channel lining materials prior to delivery.

E. Field Test Reports: Submit field density test results from the Contractor's Soils Engineer the next working day after tests are taken.

F. As-Built Survey: Upon completion of ditch and channel work, submit as-built survey data showing final bottom elevations, cross-sections, and alignment, prepared by a licensed Land Surveyor registered in the State of Hawaii.

1.4 PERMITS

A. The Contractor must obtain all permits required by the State of Hawaii Department of Health or other applicable State and local agencies prior to commencing work. Permits may include, but are not limited to:

1. NPDES General Permit for Construction Stormwater (DOH-CWB Form C – Notice of Intent / SWPPP): Required for construction activities disturbing one (1) or more acres of land. The Owner is in the process of obtaining the NPDES Permit for Construction Activities and it is expected to be received prior to start of construction. Coverage under the general permit (Notice of General Permit Coverage, NGPC) authorizes stormwater discharges only to receiving State waters from the project location identified in the NOI, provided the Contractor complies with HAR 11-54; HAR 11-55, Appendix A; HAR 11-55, Appendix C; and the information submitted in the NOI. Discharges of non-storm water toxics and other water pollutants to State waters are not authorized.

2. NPDES Permit for Dewatering Activities (DOH-CWB Form G): Required if dewatering activities require effluent discharge into State waters or drainage systems. The Contractor is responsible for obtaining this permit if one is required.

B. Post copies of all required permits at the project site in a conspicuous location accessible to inspectors.

C. Coordinate all DOH submittals through the Engineer.

1.5 QUALITY ASSURANCE

A. Survey Control: The Contractor is responsible for establishing and maintaining survey control, including grades, lines, and cross-sections for ditch and channel

excavation. Employ a Land Surveyor registered in the State of Hawaii for all survey work.

B. Environmental Compliance: The Contractor must comply at all times with all conditions of issued permits, including NPDES, SCAP, Section 404, and any other applicable permits. Non-compliance may result in a stop-work order at no additional cost to the Engineer.

C. Native Species Protection: Hawaii's stream ecosystems support endemic and endangered native aquatic species, including native stream fishes (ʻŏpūkala, nakea, ʻŏʻopu), Hawaiian freshwater shrimp ('ōpae), and native stream invertebrates. The Contractor must implement all applicable measures to prevent injury to or displacement of native aquatic species during construction. Coordinate with DLNR Division of Aquatic Resources (DAR) prior to any in-stream work.

1.6 ENVIRONMENTAL PROTECTION

A. Erosion and Sediment Control: Implement and maintain erosion and sediment control Best Management Practices (BMPs) in accordance with Section 01570 – Temporary Erosion and Sediment Control throughout the duration of work. Do not commence ditch or channel excavation until erosion and sediment controls are in place and functioning.

B. Water Quality: Do not allow sediment-laden water, concrete washout, equipment fuel, lubricants, or other pollutants to enter any ditch, channel, stream, wetland, or other water body. Comply with DOH HAR Chapters 11-54 and 11-55 at all times.

C. In-Stream Work: Work within or adjacent to live streams or watercourses must be performed during the as permitted and directed by DLNR. Minimize the duration of any in-stream disturbance. Restore stream flow as quickly as practicable following completion of in-stream work.

D. Cultural and Archaeological Resources: If human remains, artifacts, or other cultural materials are discovered during excavation, immediately stop work in the area of discovery, secure the area, and notify the Engineer and the State Historic Preservation Division (SHPD). Do not resume work in the area until authorized in writing.

PART 2 – PRODUCTS

2.1 MATERIALS

A. Satisfactory Fill and Embankment Material: Well-graded, non-expansive granular or cohesive material free from debris, organic matter, frozen material, and particles larger than 3 inches in maximum dimension. Must conform to the requirements of Section 02200 – Earthwork.

B. Riprap: Quarry-run hard, dense, durable rock, angular in shape, resistant to weathering and wetting/drying cycles. Free from shale, organic material, and soft or friable stone.

   1. Gradation must be as specified on the Drawings.

C. Filter Fabric / Geotextile: Non-woven geotextile for use beneath riprap or aggregate channel lining. Minimum grab tensile strength of 250 pounds and minimum elongation at break of 50 percent when tested in accordance with ASTM D4632.

D. Imported Borrow Material: Where on-site excavated material is unsuitable for use as channel embankment or lining, provide imported borrow material meeting the requirements of satisfactory fill material above and as approved by the Soils Engineer and the Engineer.

E. Water: Clean, potable, or approved non-potable water free from oil, acid, alkali, organic matter, or other deleterious substances, for use in compaction and dust control.

PART 3 – EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Site Examination: Examine the areas and conditions under which ditch and channel excavation is to be performed. Verify existing grades, inverts, flow lines, utility locations, and site conditions before commencing work. Report any discrepancies, conflicts, or unsuitable conditions to the Engineer in writing before proceeding.

B. Survey: Establish and verify lines, grades, and cross-sections for all ditch and channel work by a Land Surveyor registered in the State of Hawaii. Erect and maintain batter boards and grade stakes as required. The Contractor is solely responsible for the accuracy of survey control.

C. Existing Utilities: Locate and verify all underground utilities within and adjacent to the ditch and channel alignment prior to excavation. Notify the Engineer of any conflicts between proposed work and existing utilities. Protect and support all

utilities encountered during excavation. Repair any damage to existing utilities at no cost to the Engineer.

D. Clearing: Clear vegetation, roots, and other organic material from the ditch and channel alignment. Do not commence excavation until the alignment has been cleared.

3.2 DEWATERING

A. Keep excavations free from standing water. Perform all pumping, draining, and diversion necessary to maintain dry working conditions.

B. Discharge collected water to locations that will not cause erosion, sedimentation of adjacent areas, or pollution of surface water or groundwater. Obtain required permits for any water discharged off-site. Discharge must comply with DOH HAR 11-54 and 11-55 County of Kauaʻi regulations State of Hawaii Department of Health requirements.

C. Temporary Flow Diversion: Where existing ditch or channel flows must be maintained during construction, provide and maintain a temporary diversion adequate to carry the design flow without causing erosion, flooding, or property damage. Obtain approval of the Temporary Flow Diversion Plan prior to implementation.

D. In-Stream Dewatering: For work requiring dewatering of a live stream, use methods that minimize turbidity downstream and prevent entrainment of native aquatic species. Coordinate with DLNR Division of Aquatic Resources (DAR) regarding required measures. Employ screens or bypass pumping as directed.

3.3 DITCH AND CHANNEL EXCAVATION

A. Excavate ditches and channels to the lines, grades, depths, widths, and cross-sections shown on the Drawings. Maintain cut slopes as indicated. Do not over-excavate beyond the lines shown without prior approval of the Engineer.

B. Excavation Classification:

1. Unclassified Excavation: All materials encountered, regardless of character, including soil, decomposed rock, boulders, and rock, will be considered unclassified excavation. No additional compensation will be made based on the character of the material encountered.

2. Rock Excavation: Where rock is encountered, notify the Engineer before proceeding. Rock excavation must be measured and paid for as a separate item if provided in the Contract. Rock surfaces must be trimmed to the neat lines shown on the Drawings.

C. Bottom of Ditch/Channel: Grade the bottom to a smooth, uniform slope free from humps, depressions, or abrupt changes in grade. Bottom tolerance: ±0.10 foot of the design grade unless otherwise specified.

D. Side Slopes: Trim and shape side slopes to the ratios shown on the Drawings. Slope tolerance: ±0.10 foot from the design slope line measured at right angles to the slope surface. Where the cut slope intersects the existing ground surface, round off the intersection with a smooth curve.

E. Soft or Unstable Bottom: Where the channel bottom or side slopes are soft, yielding, or otherwise unstable, over-excavate to firm ground as directed by the Soils Engineer and Engineer. Backfill with approved material and compact as specified.

F. No blasting will be permitted without prior written approval of the Engineer. Where approved, blasting must conform to all applicable State and local laws and regulations.

3.4 EMBANKMENT AND CHANNEL SHAPING

A. Where embankment is required to form channel banks or dike sections, place and compact material in lifts not exceeding 8 inches loose thickness. Compact each lift to a minimum of 95 percent of the maximum dry density as determined by ASTM D1557.

B. Prepare existing ground surfaces to receive embankment by scarifying to a minimum depth of 6 inches and compacting to the specified density. Remove all vegetation, roots, and organic material before placing fill.

C. Compact areas not accessible to rollers or compactors with mechanical tampers. Jetting and ponding of fill materials are not permitted.

D. Shape channel banks and levee slopes to true, even surfaces conforming to the lines and grades shown on the Drawings. Dress slopes smooth and free of ruts, irregularities, or loose material.

3.5 CHANNEL LINING

A. Riprap Lining:

1. Install filter fabric on the prepared channel bottom and side slopes prior to placement of riprap, in accordance with manufacturer’s instructions. Overlap fabric joints a minimum of 18 inches. Secure fabric against displacement during riprap placement.

2. Place riprap on the prepared channel surface to the thickness shown on the Drawings. Place riprap by hand or with equipment in a manner that produces a dense, well-graded mass free from voids. Do not drop riprap

from a height that would damage the filter fabric or displace previously placed material.

3. Finish the riprap surface to a relatively smooth, uniform surface. Fill voids with smaller stones to produce a stable, interlocked mass.

B. Concrete Channel Lining: Place concrete lining as shown on the Drawings in accordance with Section 03300 – Cast-in-Place Concrete. Cure concrete for a minimum of 7 days before the channel is placed in service.

3.6 PROTECTION OF EXISTING FEATURES

A. Protect all existing structures, pavements, utilities, fences, walls, and improvements adjacent to the ditch and channel work from damage. Promptly repair any damage at no cost to the Owner.

B. Existing Culverts and Inlets: Protect existing culverts, catch basins, drop inlets, and other drainage structures from damage, displacement, and sedimentation during construction. Remove all accumulated sediment from existing structures at the completion of work.

C. Existing Trees and Vegetation to Remain: Protect existing trees, plants, and ground cover designated to remain. Do not damage roots of trees or shrubs to remain. Any damaged vegetation must be replaced at no cost to the Owner.

D. Benchmarks and Monuments: Carefully maintain all benchmarks, monuments, and survey reference points. If disturbed or destroyed, replace at the Contractor's expense utilizing a registered Land Surveyor licensed in the State of Hawaii.

3.7 DISPOSAL OF EXCAVATED MATERIAL

A. Dispose of all excavated material as directed. Material may be:

1. Used as approved fill or embankment material elsewhere on the project, subject to approval by the Soils Engineer and Engineer.

2. Removed from the site and legally disposed of off the Owner's property.

B. Do not stockpile excavated material in a manner that obstructs traffic, drainage, or access to adjacent properties. Do not place spoil material on road shoulders, within existing drainage facilities, or in areas that would cause sedimentation of streams or waterways.

C. Material containing hazardous substances, contaminated soil, or material determined unsuitable by the Soils Engineer must be handled and disposed of in accordance with applicable federal, State, and local regulations at no additional cost to the Owner.

3.8 COMPACTION TESTING

A. All compaction tests must show compliance with the specified density before the Contractor may proceed with placing additional lifts of fill or with placing channel lining materials.

B. Submit two (2) copies of all field density test results to the Engineer the next working day after tests are taken.

3.9 GRADING TOLERANCES AND ACCEPTANCE

A. Finished ditch and channel bottom: ±0.10 foot from design grade.

B. Finished side slopes: ±0.10 foot from design slope line, measured perpendicular to the slope.

C. The Engineer or their representative will inspect the completed ditch and channel excavation before final acceptance. Correct all deficiencies in grade, alignment, cross-section, or slope prior to final acceptance.

D. Flow Test: Upon substantial completion, the Engineer may direct the Contractor to pass a design flow through the completed ditch or channel to verify hydraulic performance. Any sections that exhibit scour, undermining, or inadequate capacity must be corrected at no cost to the Owner.

3.10 RESTORATION AND FINAL CLEAN-UP

A. Upon completion of all ditch and channel work, remove all temporary structures, diversions, dewatering equipment, stockpiled material, and construction debris from the site.

B. Grade and restore all disturbed areas outside the ditch and channel prism to match adjacent ground surface contours. Reestablish vegetation on all disturbed areas in accordance with Section 01570 – Temporary Erosion and Sediment Control.

C. Remove all temporary erosion and sediment controls after permanent vegetation is established and the potential for erosion has passed, in accordance with the NPDES permit conditions and Section 01581 – Temporary Erosion and Sediment Control.

D. Leave the entire work area clean and neat to the satisfaction of the Engineer.

3.11 FINAL INSPECTION

A. At the time of final inspection, all ditch and channel excavation work must be complete in every respect.

B. All surplus materials, debris, and temporary facilities must have been removed from the site.

C. As-built survey data must have been submitted and accepted by the Engineer.

D. Any defects discovered subsequent to this inspection must be corrected prior to final acceptance by the Engineer.

END OF SECTION

SECTION 02510

BASE COURSES

PART 1 – GENERAL

1.1 SUMMARY

A. Description: Furnish all labor, materials, testing and inspection, and equipment required for placing subbase, permeable separator, and base course on a prepared surface and furnishing and applying primer for untreated permeable base course.

1.2 SUBMITTALS

A. See Section 01300 – Submittals

B. Provide manufacturer's data, test reports, material certifications, and delivery tags.

C. Submit manufacturer's certificates of conformance for each type of material base course.

1.3 RELATED SECTIONS

A. Section 01300 – Submittals

B. Section 02200 – Earthwork

1.4 REFERENCE STANDARDS

A. Published specifications, standards, tests, or recommended methods of trade, industry, or governmental organizations apply to the work of this section where cited by the abbreviations noted below. All references to measurement and payment do not apply to this project.

1. 2005 State of Hawaii, Department of Transportation Standard Specifications & Special Provisions

a. Section 304.03 - Aggregate for Untreated Base

b. Section 703.06 - Aggregate for Untreated Base

c. Section 712.01 - Water

PART 2 – PRODUCTS

2.1 MATERIALS

A. Aggregate base course shall be as specified in Section 703.06 Aggregate for Untreated Base of the 2005 State of Hawaii, Department of Transportation Standard Specifications & Special Provisions.

B. Water shall be as specified in Section 712.01 Water of the 2005 State of Hawaii, Department of Transportation Standard Specifications & Special Provisions.

PART 3 – EXECUTION

3.1 GENERAL

A. Complete earthwork for paving and surfacing in accordance with the requirements of Section 02200 Earthwork, except as herein modified.

B. Verify that all subgrades conform to drawings and specifications. Any loose, soft or yielding areas shall be over-excavated to firm ground and replaced with air-dried borrow material and re-compacted to the specified density.

3.2 SUBGRADE PREPARATION

A. The project site should be cleared of all vegetation, concrete slabs, boulders, and other deleterious material.

B. Soft or loose soils indicated by pumping conditions should be removed and replaced with either approved onsite material or imported granular structural fill.

3.3 AGGREGATE BASE COURSE

A. Construct the aggregate base course as indicated and in accordance with Section 304.03 Aggregate for Untreated Base of the 2005 State of Hawaii, Department of Transportation Standard Specifications & Special Provisions.

B. Submit field density test results from the Contractor's Geotechnical engineer for every 400 square yards of material placed in each lift or fraction thereof.

END OF SECTION

SECTION 02520

CEMENT CONCRETE PAVEMENT

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

This section covers requirements for furnishing and installing Portland Cement Concrete pavement, with or without reinforcement, on a prepared surface.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Materials for roads and swales (road shoulder) areas shall be constructed in accordance with the below-listed sections of the counties' STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION dated September 1986, and STANDARD DETAILS FOR PUBLIC WORKS dated September 1984, as revised, except as amended in the plans and/or specifications herewith. (Paragraphs concerning Measurements and Payments in the Sections are not applicable to this project).

1.	Borrow	Section 16
2.	Subgrade	Section 29
3.	Subbase	Section 30
4.	Base Course	Section 31
5.	Portland Cement Concrete Pavement	Section 37

PART 3 - EXECUTION

3.1 INSTALLATION

A. Stake out the areas to be paved, using wooden stakes on which the final finish elevations, base course, subbase course and subgrade elevations are clearly marked. All such stakes and elevations shall be approved by the Engineer before any work is done.

B. Spray weed killer on the prepared subgrade of roads, swales and driveways, at a uniform rate of 2 gallons per 100 square feet. Notify the Engineer 24 hours before application of weed killer.

C. Install roadways, driveways, parking areas and walkways in accordance with the

applicable sections noted hereinbefore.

D. No traffic shall be allowed on concrete for at least ten (10) days.

3.2 ADJUSTMENT OF EXISTING UTILITY STRUCTURES TO FINISHED GRADE

A. Adjust existing utility structures to finished grade in accordance with Section 36 of the Counties' STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, dated September 1986. Paragraphs concerning Measurements and Payments in the section are not applicable to this project.

3.3 REPAIR OF EXISTING PAVEMENTS

A. Repair to the original condition and to the satisfaction of the Engineer, all existing pavements (including roads and walkways) that have been damaged by construction activities, including damage done by heavy equipment.

Restore pavements and other improvements in accordance with Section 38 of the Counties' STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, dated September 1986. Paragraphs concerning Measurements and Payments in the section are not applicable to this project.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Concrete slab crossing

2. Concrete cutoff wall

3. Slabs-on-grade.

4. Concrete fill

B. Related Sections:

1. Division 2 Section "Earthwork" for drainage fill under slabs-on-grade.

2. Division 2 Section “Cement Concrete Pavement” for concrete pavement and walks.

1.2 DEFINITIONS

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

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical

connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

1. Location of construction joints is subject to approval of the Engineer.

E. Qualification Data: For Installer.

F. Welding certificates.

G. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.

2. Admixtures.

3. Form materials and form-release agents.

4. Steel reinforcement and accessories.

5. Fiber reinforcement.

6. Waterstops.

7. Curing compounds.

8. Floor and slab treatments.

9. Bonding agents.

10. Adhesives.

11. Semirigid joint filler.

12. Joint-filler strips.

13. Repair materials.

H. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates

I. Field quality-control reports.

J. Minutes of preinstallation conference.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."

F. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specifications for Structural Concrete."

2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

G. Concrete Testing Service: Engage a qualified independent testing agency to perform material evaluation tests and to design concrete mixtures.

H. Preinstallation Conference: Conduct conference at Na Pali Kona Forest Reserve.

1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:

a. Contractor's superintendent.

b. Independent testing agency responsible for concrete design mixtures.

c. Ready-mix concrete manufacturer.

d. Concrete subcontractor.

e. Special concrete finish subcontractor.

2. Review special inspection and testing and inspecting agency procedures for field quality control, curing procedures, construction contraction and isolation joints, and joint-filler strips, semirigid joint fillers, forms and form removal limitations, steel reinforcement installation and concrete protection.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.

B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 - PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.

2. Exterior-grade plywood panels, suitable for concrete forms, complying with DOC PS 1, and as follows:

a. High-density overlay, Class 1 or better.

b. Medium-density overlay, Class 1 or better; mill-release agent treated and edge sealed.

c. Structural 1, B-B or better; mill oiled and edge sealed.

d. B-B (Concrete Form), Class 1 or better; mill oiled and edge sealed.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Forms for Cylindrical Columns, Pedestals, and Supports: Metal, glass-fiber-reinforced plastic, paper, or fiber tubes that will produce surfaces with gradual or abrupt irregularities not exceeding specified formwork surface class. Provide units with sufficient wall thickness to resist plastic concrete loads without detrimental deformation.

D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch minimum.

E. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

F. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

G. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1 inch to the plane of exposed concrete surface.

2. Furnish ties that, when removed, will leave holes no larger than 1 inch in diameter in concrete surface.

3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A 615/A 615M, Grade 60, deformed.

2.3 REINFORCEMENT ACCESSORIES

A. Joint Dowel Bars: ASTM A 615/A 615M, Grade 60, plain-steel bars, cut true to length with ends square and free of burrs.

B. Zinc Repair Material: ASTM A 780, zinc-based solder, paint containing zinc dust, or sprayed zinc.

C. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.

2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.

3. For zinc-coated reinforcement, use galvanized wire or dielectric-polymer-coated wire bar supports.

2.4 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C 150, Type I/II.

2. Portland Cement: ASTM C 595, Type IL/IIL.

B. Silica Fume: ASTM C 1240, amorphous silica.

C. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source.

1. Maximum Coarse-Aggregate Size: 1 inch nominal.

2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.

D. Water: ASTM C 94/C 94M.

2.5 ADMIXTURES

A. Air-Entraining Admixture: ASTM C 260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C 494/C 494M, Type A.

2. Retarding Admixture: ASTM C 494/C 494M, Type B.

3. Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type D.

4. High-Range, Water-Reducing Admixture: ASTM C 494/C 494M, Type F.

5. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494/C 494M, Type G.

6. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

C. Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete and complying with ASTM C 494/C 494M, Type C.

D. Non-Set-Accelerating Corrosion-Inhibiting Admixture: Commercially formulated, non-set-accelerating, anodic inhibitor or mixed cathodic and anodic inhibitor; capable of forming a protective barrier and minimizing chloride reactions with steel reinforcement in concrete.

2.6 WATERSTOPS

A. Flexible Rubber Waterstops: CE CRD-C 513, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

1. Profile: Ribbed with center bulb.

2. Dimensions: 4 inches by 3/16 inch thick nontapered.

B. Flexible PVC Waterstops: CE CRD-C 572, for embedding in concrete to prevent passage of fluids through joints. Factory fabricate corners, intersections, and directional changes.

1. Profile: Flat, dumbbell with center bulb.

2. Dimensions: 4 inches by 3/16 inch thick ; nontapered.

2.7 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, nondissipating.

2.8 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751.

B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, per ASTM D 2240.

C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements.

2.9 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.

3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.

4. Compressive Strength: Not less than 4100 psi at 28 days when tested according to ASTM C 109/C 109M.

2.10 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials: Use fly ash, pozzolan, ground granulated blast-furnace slag, and silica fume as needed to reduce the total amount of portland cement, which would otherwise be used, by not less than 40 percent. Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 25 percent.

2. Combined Fly Ash and Pozzolan: 25 percent.

3. Ground Granulated Blast-Furnace Slag: 50 percent.

4. Combined Fly Ash or Pozzolan and Ground Granulated Blast-Furnace Slag: 50 percent portland cement minimum, with fly ash or pozzolan not exceeding 25 percent.

5. Silica Fume: 10 percent.

6. Combined Fly Ash, Pozzolans, and Silica Fume: 35 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

7. Combined Fly Ash or Pozzolans, Ground Granulated Blast-Furnace Slag, and Silica Fume: 50 percent with fly ash or pozzolans not exceeding 25 percent and silica fume not exceeding 10 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.06 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing or plasticizing admixture in concrete, as required, for placement and workability.

2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

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

4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.

E. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

2.11 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Footings: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.

2. Maximum Water-Cementitious Materials Ratio: 0.45

3. Slump Limit: 5 inches , plus or minus 1 inch.

4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch nominal maximum aggregate size.

B. Foundation Walls: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.

2. Maximum Water-Cementitious Materials Ratio: 0.45

3. Slump Limit: 5 inches , plus or minus 1 inch.

4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch nominal maximum aggregate size.

C. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.

2. Maximum Water-Cementitious Materials Ratio: 0.45

3. Slump Limit: 5 inches , plus or minus 1 inch.

4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch nominal maximum aggregate size.

D. Concrete Toppings: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi at 28 days.

2. Maximum Water-Cementitious Materials Ratio: 0.45

3. Slump Limit: 5 inches , plus or minus 1 inch.

4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1-inch nominal maximum aggregate size.

2.12 FABRICATING REINFORCEMENT

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

2.13 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F ,reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F, reduce mixing and delivery time to 60 minutes.

B. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.

1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.

2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.

3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 - EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347 as abrupt or gradual, as follows:

1. Class B, 1/4 inch for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.

2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

2. Install reglets to receive waterproofing and to receive through-wall flashings in outer face of concrete frame at exterior walls, where flashing is shown at lintels, shelf angles, and other conditions.

3. Install dovetail anchor slots in concrete structures as indicated.

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achieved at least 70 percent of its 28-day design compressive strength.

2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Engineer.

3.4 SHORES AND RESHORES

A. Comply with ACI 318 and ACI 301 for design, installation, and removal of shoring and reshoring.

1. Do not remove shoring or reshoring until measurement of slab tolerances is complete.

B. In multistory construction, extend shoring or reshoring over a sufficient number of stories to distribute loads in such a manner that no floor or member will be excessively loaded or will induce tensile stress in concrete members without sufficient steel reinforcement.

C. Plan sequence of removal of shores and reshore to avoid damage to concrete. Locate and provide adequate reshoring to support construction without excessive stress or deflection.

3.5 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor retarder. Repair damage and reseal vapor retarder before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld PS reinforcing bars.

1. Weld reinforcing bars according to AWS D1.4/D 1.4M, where indicated.

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

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

F. Epoxy-Coated Reinforcement: Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.

G. Zinc-Coated Reinforcement: Repair cut and damaged zinc coatings with zinc repair material according to ASTM A 780. Use galvanized steel wire ties to fasten zinc-coated steel reinforcement.

3.6 JOINTS

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

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Engineer.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.

2. Form keyed joints as indicated. Embed keys at least 1-1/2 inches into concrete.

3. Locate joints for beams, slabs, joists, and girders in the middle third of spans. Offset joints in girders a minimum distance of twice the beam width from a beam-girder intersection.

4. Locate horizontal joints in walls and columns at underside of floors, slabs, beams, and girders and at the top of footings or floor slabs.

5. Space vertical joints in walls as indicated. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.

6. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

7. Use epoxy-bonding adhesive at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Grooved Joints: Form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces.

2. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.

2. Terminate full-width joint-filler strips not less than 1/2 inch or more than 1 inch below finished concrete surface where joint sealants, specified in Division 7 Section "Joint Sealants," are indicated.

3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints: Install dowel bars and support assemblies at joints where indicated. Lubricate or asphalt coat one-half of dowel length to prevent concrete bonding to one side of joint.

3.7 WATERSTOPS

A. Flexible Waterstops: Install in construction joints and at other joints indicated to form a continuous diaphragm. Install in longest lengths practicable. Support and protect exposed waterstops during progress of the Work. Field fabricate joints in waterstops according to manufacturer's written instructions.

3.8 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Engineer.

C. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

1. Do not add water to concrete after adding high-range water-reducing admixtures to mixture.

D. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.

2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.

3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

E. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.

2. Maintain reinforcement in position on chairs during concrete placement.

3. Screed slab surfaces with a straightedge and strike off to correct elevations.

4. Slope surfaces uniformly to drains where required.

5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

F. Hot-Weather Placement: Comply with ACI 301 and as follows:

1. Maintain concrete temperature below 90 deg F time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.

2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.9 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

B. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

C. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

3.10 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308.1, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.

    b. Continuous water-fog spray.

    c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12-inch lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inches, and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair

any holes or tears during curing period using cover material and waterproof tape.

a. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive floor coverings.

b. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.

c. Cure concrete surfaces to receive floor coverings with either a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer.

4. Curing and Sealing Compound: Apply uniformly to floors and slabs indicated in a continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Repeat process 24 hours later and apply a second coat. Maintain continuity of coating and repair damage during curing period.

3.11 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least [one] [six] month(s). Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

C. Install semirigid joint filler full depth in saw-cut joints and at least 2 inches deep in formed joints. Overfill joint and trim joint filler flush with top of joint after hardening.

3.12 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Engineer. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch in any dimension to solid concrete. Limit cut depth to 3/4 inch. Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Engineer.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.

2. After concrete has cured at least 14 days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with

patching mortar. Finish repaired areas to blend into adjacent concrete.

4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.

5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

6. Repair defective areas, except random cracks and single holes 1 inch or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4-inch clearance all around. Dampen concrete surfaces in contact with patching concrete and apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

7. Repair random cracks and single holes 1 inch or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Engineer's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Engineer's approval.

3.13 FIELD QUALITY CONTROL

A. Testing and Inspecting: The Contractor shall engage a special inspector and qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Testing and Inspecting: Engage a qualified testing and inspecting agency to perform tests and inspections and to submit reports.

C. Inspections:

1. Steel reinforcement placement.

2. Steel reinforcement welding.

3. Headed bolts and studs.

4. Verification of use of required design mixture.

5. Concrete placement, including conveying and depositing.

6. Curing procedures and maintenance of curing temperature.

7. Verification of concrete strength before removal of shores and forms from beams and slabs.

D. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C 172 shall be performed according to the following requirements:

1. Testing Frequency: Obtain one composite sample for each day's pour of each concrete mixture exceeding 5 cu. yd., but less than 25 cu. yd., plus one set for each additional 50 cu. yd. or fraction thereof.

2. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. or fraction thereof of each concrete mixture placed each day.

   a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.

3. Slump: ASTM C 143/C 143M; 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.

4. Compression Test Specimens: ASTM C 31/C 31M.

   a. Cast and laboratory cure two sets of two standard cylinder specimens for each composite sample.

   b. Cast and field cure two sets of two standard cylinder specimens for each composite sample.

5. Compressive-Strength Tests: ASTM C 39/C 39M; test one set of two laboratory-cured specimens at 7 days and one set of two specimens at 28 days.

   a. Test one set of two field-cured specimens at 7 days and one set of two specimens at 28 days.

b. A compressive-strength test shall be the average compressive strength from a set of two specimens obtained from same composite sample and tested at age indicated.

6. When strength of field-cured cylinders is less than 85 percent of companion laboratory-cured cylinders, Contractor shall evaluate operations and provide corrective procedures for protecting and curing in-place concrete.

7. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi.

8. Test results shall be reported in writing to Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.

9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Engineer but will not be used as sole basis for approval or rejection of concrete.

10. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Engineer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C 42/C 42M or by other methods as directed by Engineer.

11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

END OF SECTION