

Division of Boating and Ocean Recreation

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

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BOARD OF LAND AND NATURAL RESOURCES

Suzanne D. Case  
Chairperson

CONTRACT SPECIFICATIONS AND PLANS

Job No. MA16-05  
Kihei Boat Ramp Paving and Drainage Improvements  
Kihei, Maui, Hawaii

June 2016

State of Hawaii  
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Kihei Boat Ramp Paving and Drainage Improvements  
Kihei, Maui, Hawaii

Approved:



EDWARD R. UNDERWOOD

Administrator

Division of Boating and Ocean Recreation

Approved:



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June 2016

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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. MA16-05 KIHEI BOAT RAMP PAVING AND DRAINAGE IMPROVEMENTS** shall be submitted to the Department of Land and Natural Resources, Division of Boating and Ocean Recreation, Engineering Branch on the specified date and time through the State of Hawaii e-Procurement System (HIePRO). HIePRO is accessible through the State Procurement Office website at [www.hawaii.gov/spo](http://www.hawaii.gov/spo).

The Department of Land and Natural Resources Interim General Conditions dated October 1994, as amended, and the General Conditions – AGS008 latest revision (General Conditions), shall be made a part of the specifications. Electronic copies of the General Conditions are available through the State Procurement Office website.

Plans and specifications may be obtained through the HIePRO system, listed under the Job No. and Project title above.

This project is located at the Kihei Boat Ramp, Maui, Hawaii. Tax Map Key (2) 3-9-004:001 and 061 (Portions).

The work shall generally include demolition work, site preparation, grading, drainage improvements, construction of asphaltic and concrete pavement, and construction of a new boat wash down facility at the Kihei Boat Ramp, Maui, Hawaii.

The estimated cost of construction is \$495,000.00.

All interested parties are encouraged to conduct a thorough site visit prior to bidding. A pre-bid conference will not be held for this project.

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

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

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

The Engineering Branch Head of the Department of Land and Natural Resources, Division of Boating and Ocean Recreation is responsible for administering and overseeing the Contract, including monitoring and assessing contractor performance.

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

This project is subject to Hawaii Products Preference and Recycled Products Preference. For bidding purposes only, bid prices may be adjusted in accordance with the applicable preferences.

Should there be any questions, please use the question and answer section of the HIePRO solicitation.

# INFORMATION AND INSTRUCTIONS TO BIDDERS

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## INFORMATION AND INSTRUCTIONS TO BIDDERS

- A. PROJECT LOCATION AND SCOPE OF WORK: The project location and scope of work shall be as generally described in the Notice to Bidders.
- B. PROPOSALS: Competitive proposals shall be submitted to the Department of Land and Natural Resources, Division of Boating and Ocean Recreation through the State of Hawaii e-Procurement System (HIePRO) on the specified date and time indicated on the solicitation. HIePRO is accessible through the State Procurement Office website at [www.hawaii.gov/spo](http://www.hawaii.gov/spo).
- C. SPECIFICATIONS: 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. In case of any conflict between the General Conditions, Contract Specifications, and Plans included herein, the Plans shall govern over the Contract Specifications and General Conditions; the Contract Specifications shall govern over 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. RESPONSIBILITY OF BIDDERS TO STUDY SITE: At the time of bid opening, each bidder will be presumed to have conducted a detailed inspection of the project site, to have read and be familiar with the Plans, Specifications and other contract documents including all Addenda. The failure or omission of any bidder to thoroughly inspect the site or to receive or examine any form, instrument, or document shall in no way relieve him from any obligation regarding his bid.
- F. INTERPRETATION OF CONTRACT DOCUMENTS AND ADDENDA: If any prospective bidder is in doubt as to the true meaning of any part of the contract documents, a request for information (RFI) shall be submitted to the DLNR Division of Boating and Ocean Recreation no later than 8 days prior to the time established for the opening of bids. All interpretation of the contract documents and applicable responses to RFI will be made only by addendum, which shall be issued via the HIePRO system. All prospective bidders are responsible to regularly check HIePRO for the issuance of any addenda related to the project.
- G. 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).
- H. NOTICE OF INTENT TO BID AND QUESTIONNAIRE:  
A Notice of Intent to Bid is not required for this project. In compliance with HRS Section 103D-310, the lowest responsive and responsible bidder may be required to complete a standard questionnaire. When required, the completed questionnaire shall be submitted to the Engineering Branch Head 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.

- I. **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. **No bid security is required for bids less than \$50,000.**

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. For construction contracts less than \$250,000, the State reserves the right to contract the work under a purchase order.

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.

- J. **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. This project will require a State Contractor's license, classification "A".
- K. **IRREGULAR BIDS**: No irregular bids or propositions for doing the work will be considered by the Board.
- L. **WITHDRAWAL OF BIDS**: No bidder may withdraw his bid between the time of the opening thereof and the award of contract.
- M. **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. **Performance and payment bonds are not required for bids less than \$50,000.**
- N. **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. **For contracts less than \$50,000, the State reserves the right to contract the work under a purchase order.**
- O. **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.

- P. 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.

- Q. PERMITS: The Contractor shall be responsible to ascertain and obtain any required permits associated with this project 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.
- R. 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.

- S. 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.

- T. 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.
- U. 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.
- V. HIRING OF LOCAL LABOR: The Contractor shall hire local labor whenever practicable.
- W. 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.
- X. 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.
- Y. 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.
- Z. AS-BUILT DRAWINGS: As-built drawings, the intent of which is to record the actual in-place construction so that any future renovations or tie-ins can be anticipated accurately, shall be required. All authorizations given by the Engineer to deviate from the plans shall be drawn on the job site plans. All deviations from alignments, elevations and dimensions which are stipulated on the plans shall be recorded on the as-built drawings. Final as-built drawings shall be submitted to the Engineer by the Contractor at the end of the project in both hard copy and electronic copy in Adobe PDF format on CD ROM.

- Z1. 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
- Z2. 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: The contractor shall be required to provide their own portable toilet facilities throughout the duration of the project. All toilet facilities constructed at the project site shall be in accordance with the Public Health Regulations of the State Department of Health (DOH). All necessary precautions shall be observed at the project site. The use of sanitary facilities shall be strictly enforced and workers violating these provisions shall be promptly discharged.
- BB. SIGNS: Whenever the project involves closing or obstructing any public thoroughfare, the Contractor shall provide traffic signs conforming to the applicable provisions of the current edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways", published by the Federal Highway Administration as directed by the Engineer for the purpose of diverting or warning traffic prior to the construction area. All traffic signs shall bear proper wording stating thereon the necessary information as to diverting or warning traffic.
- The Contractor shall also provide a project sign, size 4'-0" x 7'-0" to be placed as directed by the Engineer. The sign shall be constructed in accordance with Section 01581 - Project Sign of these specifications and approved by the Engineer. All wording, type and size of lettering and color selection shall be as specified in these specifications or as approved by the Engineer.
- CC. FIELD OFFICE AREA FOR DEPARTMENT: **A field office for DLNR will not be required for this project.**
- 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 the contactor shall be in compliance with the following requirements:

- 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.

**COMPLIANCE, DOCUMENTATION AND HAWAII COMPLIANCE EXPRESS**

As a condition for award of the contract and as proof of compliance with the following requirements of 103D-310(c) HRS:

Vendors are required to be compliant with all appropriate state and federal statutes. Proof of compliance (compliance documentation) is required. See the HIePRO Buyer FAQ on the State Procurement website for more information.

Proof of compliance/documentation is obtained through Hawaii Compliance Express (HCE). Vendors shall register in Hawaii Compliance Express (HCE), a program separate from HIePRO. The annual subscription fee to utilize the HCE service is currently \$12.00. Allow 2 weeks to obtain complete compliance status after initial registration. It is highly recommended that vendors subscribe to HCE prior to responding to a solicitation.

The vendor is responsible for maintaining compliance. If the vendor does not maintain timely compliance in HCE, an offer otherwise deemed responsive and responsible may not be awarded.

**Vendors are required to be compliant with all of the requirements of 103D-310(c) HRS at the specified response due date (bid opening). The proof of compliance/documentation will be verified through the Hawaii Compliance Express.**

**Failure to be fully compliant at the specified response date shall deem the vendor's bid to be non-responsive and vendor's bid will be rejected.**

## **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.

### **COMPLIANCE, DOCUMENTATION AND HAWAII COMPLIANCE EXPRESS**

Vendors are required to be compliant with all appropriate state and federal statutes. Proof of compliance (compliance documentation) is required. See the HlePRO Buyer FAQ on the State

Procurement website for more information.

Proof of compliance/documentation is obtained through Hawaii Compliance Express (HCE). Vendors shall register in Hawaii Compliance Express (HCE), a program separate from HlePRO. The annual subscription fee to utilize the HCE service is currently \$12.00. Allow 2 weeks to obtain complete compliance status after initial registration. It is highly recommended that vendors subscribe to HCE prior to responding to a solicitation.

The vendor is responsible for maintaining compliance. If the vendor does not maintain timely compliance in HCE, an offer otherwise deemed responsive and responsible may not be awarded.

## 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 in writing to CHIEF ENGINEER, ENGINEERING DIVISION, P.O. BOX 373, HONOLULU, HAWAII, 96809 for interpretation and must be received by the Engineering Division no later than fourteen (14) calendar days prior to the date fixed for bid opening. 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 opening of bids. It shall be the prospective bidder’s sole responsibility to verify and obtain any said addenda from the office of the Engineering Division. 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**

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

### **Section 5 – Control of Work**

**AMEND** Section 5.8 Value Engineering Incentive by deleting “\$100,000” and replacing with

“\$250,000” in the first paragraph.

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

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

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

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

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

“d. Insurance Requirements

#### 1. Obligation of Contractor

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

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

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

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

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

The Contractor shall, from time to time, furnish the Engineer, when requested,

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

## 2. Types of Insurance

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

(a) Worker's Compensation. The Contractor and all subcontractors shall obtain full worker's compensation insurance coverage for all persons whom they employ or may employ in carrying out the work under this contract. This insurance shall be in strict conformity with the requirements of the most current and applicable State of Hawaii Worker's Compensation Insurance laws in effect on the date of the execution of this contract and as modified during the duration of the contract.

(b) Commercial General Liability Insurance and Automobile Insurance. Contractor's commercial general liability insurance and automobile liability insurance shall both be obtained in a combined, single limit of not less than \$1,000,000 per occurrence that shall include coverage for bodily injury, sickness, disease or death of any person, arising directly or indirectly out of, or in connection with, the performance of work under this contract.

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

The Contractor shall either:

- i. Require each of its subcontractors to procure and to maintain during the life of its subcontract, subcontractors' comprehensive general liability, automobile liability and property damage liability insurance of the type and in the same amounts specified herein; or
- ii. Insure the activities of its subcontractors in its own policy.

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

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

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

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

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

The Contractor shall pay all just claims for materials, supplies, tools, labor and other just claims against the Contractor or any subcontractor in connection with this contract and the surety bond will not be released by final acceptance and payment by the Department unless all such claims are paid or released. The Department may, but is not obligated to, withhold or retain as much of the monies due or to become due the Contractor under this contract considered necessary by the Engineer to cover such just claims until satisfactory proof of payment or the establishment of a payment plan is presented.

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

**Section 8 – Measurement and Payment**

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

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

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

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

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

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

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

**Job No. MA16-05, Kihei Boat Ramp Paving and Drainage Improvemets, Kihei, Maui, Hawaii**

**NOTE: Contractors are not required to submit a new Qualification Questionnaire if they have submitted a Qualification Questionnaire to DLNR-Division of Boating and Ocean Recreation within the last twenty-four (24) months prior to bid opening for this project.**

**QUALIFICATION QUESTIONNAIRE**

**1.0 GENERAL REQUIREMENTS**

- 1.0.1 The Qualification Questionnaire shall be completed and properly executed. DOBOR will review the Questionnaire to determine whether the prospective Bidder's experience, competence and financial standing meet the minimum qualifications set herein.
- 1.0.2 If upon review of the Qualification Questionnaire, the prospective Bidder appears not fully qualified or able to carry out the terms and conditions of the Contract that may be awarded, DOBOR shall afford the prospective Bidder an opportunity to be heard.
- 1.0.3 Failure to complete the Qualification Questionnaire, or submit the Qualification Questionnaire within the prescribed time, is sufficient cause to disqualify a prospective Bidder.
- 1.0.4 All information contained in the Qualification Questionnaire shall remain confidential, and Qualification Questionnaires of all Bidders shall be shredded after having served their purpose.

**2.0 QUALIFICATIONS**

Only qualified applicants, as determined by the Division of Boating and Ocean Recreation of the Department of Land and Natural Resources may bid on this project. In order to be considered, the entire Qualification Questionnaire must be completed.

Having been first duly sworn and deposed, the undersigned states that it has the minimum qualifications required under this solicitation and that it is furnishing the attached information as proof of its qualifications. All Bidders shall submit this Qualification Questionnaire and all the required evidence. Bidders that do not submit a Qualification Questionnaire and the required documentation shall be disqualified from bidding.

2.1. Name of Business: \_\_\_\_\_

2.2. Business Organization: [ ] Individual [ ] Partnership [ ] Corporation [ ] Other

2.3. Principal Office Address: \_\_\_\_\_

2.4. State General Excise Tax Number: \_\_\_\_\_

2.5. Federal Employer I.D. Number: \_\_\_\_\_

2.6 Company Information:

When incorporated and where: \_\_\_\_\_

When authorized to do business in the State of Hawaii: \_\_\_\_\_

Name of Officers:

President: \_\_\_\_\_

Vice President: \_\_\_\_\_

Secretary: \_\_\_\_\_

Treasurer: \_\_\_\_\_

Principal Stockholders:

Name and Address	% of Stock
------------------	------------

(1)	_____
-----	-------

(2)	_____
-----	-------

(3)	_____
-----	-------

2.7. If a Partnership, please answer the following:

When and where organized: \_\_\_\_\_

General or Limited Partnership: \_\_\_\_\_

When registered in the State of Hawaii: \_\_\_\_\_

Partners: Name and Address	Share
----------------------------	-------

(1) \_\_\_\_\_

(2) \_\_\_\_\_

2.8. If "other" type of entity, please describe: \_\_\_\_\_

\_\_\_\_\_

Where and when organized: \_\_\_\_\_

\_\_\_\_\_

List Members: \_\_\_\_\_

\_\_\_\_\_

2.9. Provide a description and evidence of a minimum of five (5) years of experience in the ownership and/or operation of a construction company specializing in trucking and/or site work; asphaltic concrete pavement; reinforced concrete pavement and/or projects similar to that described in this solicitation, including the number of years of experience, business name, business address, and dates of operation.

2.10. Provide evidence of the Bidder's ability to perform the scope of work indicated in the specifications. Attach any information sheet showing but not limited to the qualifications for key personnel that will be involved in the implementation of the project.

2.11. Provide list of equipment, including type, age and specifications that will be used to meet the terms of the contract. Indicate equipment that are owned and/or equipment that will be purchased or rented.

2.12. Has the Bidder ever defaulted or been terminated on a State of Hawaii contract or defaulted on real property taxes? If yes, give details on a separate sheet.

Yes       No

2.13. Has the Bidder ever been fined for any violation of City, County, Federal and/or State of Hawaii law during the previous two years? If yes, give details on a separate sheet.

Yes       No

2.14. Provide at least two (2) references that the Division of Boating and Ocean Recreation may contact to confirm the Bidder's qualifications. Provide names, contact information, and the relationship or experience with each reference.

2.15. As a condition for award of the contract and as proof of compliance with the following requirements of 103D-310(c) HRS:

Vendors are required to be compliant with all appropriate state and federal statutes. Proof of compliance (compliance documentation) is required. Proof of compliance/documentation is obtained through Hawaii Compliance Express (HCE). Vendors shall register in Hawaii Compliance Express (HCE), a program separate from HePS. The vendor is responsible for maintaining compliance. If the vendor does not maintain timely compliance in HCE, an offer otherwise deemed responsive and responsible may not be awarded.

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

2.16. Bidder shall indemnify, defend, and hold harmless the State of Hawaii employees from and against all liability, lost, damage, cost, and expense, including all attorneys' fees, and all claims, suits, and demands.

Yes       No

Respectfully submitted,

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

By \_\_\_\_\_  
Signature

Title \_\_\_\_\_

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

Date \_\_\_\_\_

Address \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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

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

NOTES:

1. Bidder's may attach any other information they wish to further describe their qualifications.

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## SECTION 01019

### GENERAL SPECIFICATIONS

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

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

##### 1.2 GENERAL

- A. Construction Lines, Levels and Grades: The Contractor shall verify all lines, levels and elevations indicated on the drawings before any clearing, excavation or construction begins. Any discrepancy shall be immediately brought to the attention of the Engineer, and any change shall be made in accordance with the Engineer's instruction. The Contractor shall not be entitled to extra payment for failing to report the discrepancies before proceeding with any work whether within the area affected or not.
- B. Examination of Premises: The Contractor shall contact the Engineer and obtain permission before visiting the site.
- C. Notices: The Contractor shall notify the Engineer and give at least three (3) working days notice before starting any work.
- D. Disruption of Utility Services: All work related to the temporary disconnection of electrical 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's occupied rooms and other occupied spaces for the user agency personnel and the public at all times.

F. Contractor Use of Premises

1. The Contractor shall review the applicable asbestos survey reports and insure that he fully understands their contents as to whether and where there may be asbestos containing materials (ACM) in the building(s) in which he will be working.
2. The Contractor shall inform its employees, subcontractors and all other persons engaged in the project of the presence (as applicable) of asbestos in the existing buildings at the job site in accordance with the requirements of Chapter 110, Article 12-110-2 (f) (1) (B) of the Occupational Safety and Health Standards, State of Hawaii.
3. In the event the Contractor, its subcontractor(s) and/or other persons engaged in the project must work in any building(s) on the site other than that one(s) designated in the project, the Contractor shall request copies of the asbestos survey report(s) for the building(s) from the Engineer and notify all persons as indicated in Item 2 above.
4. 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).
5. If lead testing was done and the data is appended to this Section, the Contractor shall review the data to insure understanding of lead containing paint identification and location, that the testing was for design purposes only, and that the results do not satisfy any of the requirements of the Chapter 12-148, HAR.

a. Legend for Asbestos Survey Report

ACM	Asbestos containing material
USA	Unified Sampling Area. A USA is an area containing suspect ACM which are consistent throughout the entire USA. Consistent means that the material does not look or feel different within the USA.
ACBM	Asbestos Containing Building Material. These materials have been proven to contain asbestos through analysis of bulk samples collected during the inspection.

Friable	ACBM Material that may be mechanically broken down by moderate hand pressure to create airborne fibers. These materials have been proven to contain asbestos through analysis of bulk samples.
Non-friable	ACBM Materials (other than friable) that have been proven to contain asbestos through analysis of bulk samples.
Friable Assumed	Materials that may be mechanically broken down by moderate hand pressure to create airborne fibers. These materials were assumed to contain asbestos and must be treated as such. No bulk samples were collected from these materials.
Non-Friable Assumed	Material (other than friable materials) that were assumed to contain asbestos and must be treated as such. No bulk samples were collected from these materials.
No Suspect Materials	This category includes those buildings where no suspect ACMs were found and no samples collected; and those buildings where suspect materials were identified and sampled but analysis proved they do not contain asbestos. This classification represents a building that does not contain ACMs covered under the Asbestos Hazard Emergency Response Act (AHERA) regulations. This does not always mean that the building is asbestos-free.
US Group	<p>Contains 14 digits of the sample number specific to the Unified Sampling Area.</p> <p>The USA is analogous to the Homogeneous Area state in the regulations.</p> <p>Example:      11-0005-012-001-01</p> <p>11                State Identification</p> <p>0005            School District or Agency Identification</p> <p>012             Campus or Facility Identification</p> <p>001             Building Identification</p> <p>01                USA Identification</p>

SAM#	Contain the two-digit sample number specific to the individual sample vial.
CONT	(Consistent) This is a visual determination by the microscopist based on whether the members of the Unified Sampling Area are actually taken from a consistent source material.
ASS	States whether the sample is positive (Y) for asbestos content (greater than 1%) or negative (N) for asbestos content (less than or equal to 1%). Samples that contain greater than 1% asbestos will have the quantification in the appropriate column.
CHRY	Chrysotile asbestos.
AMOS	Amosite asbestos.
CROC	Crocidolite asbestos.
ANTH	Anthophyllite asbestos.
ACT/TREM	Actinolite/Tremolite.
% ASB	Total percentage of asbestos in the sample.

**OTHER MATERIALS:**

WOOL	Mineral wool, rock wool or fiber glass.
CELL	Cellulose (wood fiber, paper, or plant fiber).
MICA	Micaceous minerals (Vermiculite, Biotite, Muscovite and Chlorite).
PUMC	Pumice or perlite.
BIND	Binders, fillers and cements.
OTHER	Other Material.
TOT %	Total % of all constituents of the sample.
BS Code	Bulk Sample Code. This BS Code represents the type of material that was sampled. The Bulk Sample descriptions used are as follows:

<u>BS Code</u>	<u>Description</u>
0	Unknown
1	Accoustical Plaster
2	Accoust./Therm. Plaster
3	Hardwall/Ceil. Plaster
4	Vinyl Floor Tile
5	Pipe Covering
6	Corrugated Pipe Covering
7	Wrapped Paper Pipe Cover
8	Boiler/Tank Insulation
9	Breeching/Exhaust Packing
10	Woven Paper/Tape
11	Drop or Lay-in Panel
12	Accoustical Tile (1x1)
13	Fire or Stage Curtain
14	MJP on Non-Suspect Pipe
15	MJP on Pipe Covering
16	MJP on Corr. Pipe Cover
17	MJP on Wrapped Pipe Cover
18	Fireproofing
19	Vibration Joint Cloth
20	Interior Duct Insulation
21	Exterior Duct Insulation
22	Blown-in Insulation
23	Stored Insulation
24	Debris
25	Gasket
26	Transite Pipe
27	Transite Hood
28	Asbestos Pad
29	Asbestos Glove
30	Asbestos Rope
31	Rab Asbestos
32	Electrical Wiring
33	Fire Hose
34	Fire Door
35	Fire Suit
36	Fire Brick
37	Lab Counter Top
38	Fiber Pack Kiln
39	Tongs
40	Poured in Insulation
41	Contaminated Soil
42	Tectum
43	Floor Underlayment

44	Hard Grout
45	Mortar
46	Brown/Scratch Coat
47	Oven/Autoclave Lining
48	Brake Lining
49	Theater Curtain
50	Transite Siding
51	Linoleum
52	Wallboard
60	Chalkboard
99	Other

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. In addition, the following requirements of the State Department of Health (DOH) must be strictly adhered to in the Forest Reserve area:

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

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 together with the marked-up field office plans to the Engineer.

- 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 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. Division 16 - Electrical Work.
2. Any others as called for in the plans, specifications or by the Engineer.

B. Other required submittals shall include:

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

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

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

END OF SECTION

## SECTION 01530

### BARRICADES

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

- A. Description. This work shall consist of furnishing, installing and maintaining barricades in accordance with the requirements of the contract. The contractor shall be required to provide barricades and signage required to control traffic and designate "no parking" areas as necessary to complete the contract work. Barricades and signs shall be considered incidental to contractor's mobilization and demobilization costs.

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

#### PART 2 - PRODUCTS

##### 2.1 MATERIALS

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

#### PART 3 - EXECUTION

##### 3.1 CONSTRUCTION REQUIREMENTS

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

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

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

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

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

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

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

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

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

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

Wooden rails shall be reflectorized with one of the following:

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

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

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

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

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

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

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

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

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

END OF SECTION

## SECTION 01567

### ENVIRONMENTAL PERMITS AND POLLUTION CONTROL

#### PART 1 - GENERAL

##### 1.01 GENERAL:

This section covers the requirements of environmental permits and pollution control during construction activities.

The contractor shall employ Best Management Practices (BMPs) and install all necessary measures to ensure no pollution, erosion, runoff, etc. escapes the project site.

The Contractor shall be responsible for conformance to Title 11, Chapter 60 of the Public Health Regulations, Department of Health, State of Hawaii.

- A. With the exception of those measures set forth elsewhere in these specifications, environmental protection shall consist of the prevention of environmental pollution as the result of construction operations under this contract. For the purpose of this specification, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare, unfavorably alter ecological balances of importance to human life, affect other species of importance to man, or degrade the utilization of the environment for aesthetic and recreational purposes.
- B. The work under this section shall include the following:
  - 1. Make sure that all permits listed in these specifications are obtained and valid for the construction period.
  - 2. Provide all air and water quality testing and monitoring work required by the permits during construction.
  - 3. Provide all facilities, equipment and structural controls for minimizing adverse impacts upon the environment during the construction period.

##### 1.02 RELATED ARTICLE

#### SECTION 01570 - WATER QUALITY MONITORING

##### 1.03 GENERAL REQUIREMENTS

- A. Applicable Regulations: In order to provide for abatement and control of environmental pollution arising from the construction activities of the Contractor  
Environmental Permits and Pollution Control

and his subcontractors in the performance of this contract, the work performed shall comply with the intent of the applicable Federal, State, and local laws and regulations concerning environmental pollution control and abatement, including, but not limited to the following regulations:

1. State of Hawaii, Department of Health, Administrative Rules, Chapter 55, WATER POLLUTION CONTROL: Chapter 54, WATER QUALITY STANDARDS.
2. State of Hawaii, Department of Health, Administrative Rules, Chapter 59, AMBIENT AIR QUALITY: Chapter 60, AIR POLLUTION CONTROL LAW.
3. State of Hawaii, Department of Health, Administrative Rules, Chapter 44A, VEHICULAR NOISE CONTROL.
4. State of Hawaii, Occupational Safety and Health Standards, Title 12, Department of Labor and Industrial Relations, Subtitle 8, Division of Occupational Safety and Health, Subparagraph 12-202-13, ASBESTOS DUST: Environmental Protection Agency, Code of Federal Regulations Title 40, Part 61 Subpart A, NATIONAL EMISSION STANDARDS FOR AIR POLLUTANTS and Subpart B, NATIONAL EMISSION STANDARDS FOR ASBESTOS; and U.S. Department of Labor Occupational Safety and Health Administration (OSHA) Asbestos Regulations, Code of Federal Regulations Title 29, Part 1910.
5. Rules Relating to Soil Erosion Standards and Guidelines, April 1999, County of Hawaii.

B. Permits

1. The contractor will be required to comply with all permits related to the project.
2. All permit applications and forms shall be submitted to the Department of Land and Natural Resources, Division of Boating and Ocean Recreation for review and comment prior to submission to the accepting agencies.

1.04 GUIDELINES AND CRITERIA:

A. Solid Waste and Disposal:

1. Construction waste, such as crates, boxes, building materials, pipes, and other rubbish shall be reduced to a size approved by the City and County

of Honolulu. Large size objects shall be reduced to a size acceptable by the County Specifications for disposal in their landfills. Other areas or methods proposed by the Contractor will be approved only if the Engineer determines that their effect on the environment is equal to or less than those described herein.

2. Removal of waste shall be a continuous on-going operation. Wastes and debris shall not be allowed to accumulate in large open piles.
3. Wind-blown wastes and debris and wastes left by workers shall be collected by the Contractor and disposed of as described above. No rubbish shall be deposited in the trench excavation for this project.
4. Conduct the fueling and lubricating of equipment and motor vehicles to protect against spills and evaporation. Dispose of lubricants to be discarded and all excess oil in accordance with State and local regulations.
5. Dispose of electrolyte solution from lead-acid batteries in accordance with hazardous regulations. Do not dump electrolyte onto the ground or into storm drains or sanitary sewers. Transport the electrolyte to a State approved hazardous waste disposal site. The method of transportation and equipment shall comply with applicable Federal and State regulations.
6. No burning of debris and/or waste materials shall be permitted on the project site.
7. 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.
8. 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.
9. No dry sweeping shall be permitted in cleaning rubbish and fines which can become airborne from floors or other paved areas. Vacuuming, wet mopping or wet or damp sweeping is permissible.
10. Clean-up shall include the collection of all waste paper and wrapping materials, cans, bottles, construction waste materials and other objectionable materials, and removal as required. Frequency of clean-up shall coincide with rubbish producing events.

B. Dust Control: Dust, which could damage crops, orchards, cultivated fields and dwellings, or cause nuisance to persons, shall be abated and control measures shall be performed. The Contractor shall be held liable for any damage resulting from dust originating from his operations.

1. The Contractor, for the duration of the contract, shall maintain all excavations, embankments, haul roads, permanent access roads, plant sites, waste disposal areas, borrow areas, and all other work areas within or without the project limits free from dust which would cause a hazard to the work, or the operations of other contractors, or to persons or property. Industry accepted methods of stabilization suitable for the area involved, such as sprinkling or similar methods, will be permitted. Chemicals or oil treating shall not be used.
2. 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.
3. The method of dust control and costs shall be the responsibility of the Contractor. Methods of dust control shall include the use of water, chemicals or asphalt over surfaces which may create airborne dust.
4. The Contractor shall be responsible for all damage claims in accordance with Section 7.16 - "Responsibility for Damage Claims" of the GENERAL CONDITIONS.

C. Air Pollution Control:

1. Emission: The Contractor shall not be allowed to operate equipment and vehicles that show excessive emissions of exhaust gases until corrective repairs or adjustments are made to the satisfaction of the Engineer.

D. Waste Waters: Construction operations shall be conducted so as to prevent discharge or accidental spillage of pollutants, solid waste, debris, and other objectionable wastes in surface waters and underground water sources.

E. Noise Control:

1. Noise shall be kept within acceptable levels at all times in conformance with Title II, Administration Rules, Chapter 43, Community Noise Control for Hawaii, State Department of Health, Public Health Regulations. The Contractor shall obtain and pay for 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. Construction equipment shall be equipped with suitable mufflers to maintain noise within levels complying with applicable regulations.
3. Construction operations shall be confined to the period between 7:00 a.m. and 3:30 p.m., Monday through Friday. Construction will not be permitted on weekends and legal State and Federal holidays. In the event the Contractor's operations require the State's inspectional and engineering personnel to work overtime, the Contractor shall reimburse the State for the cost of such service.
4. Starting up of construction equipment meeting allowable noise limits shall not be done prior to 7:00 a.m. without prior approval of the Engineer. Equipment exceeding allowable noise limits shall not be started up prior to 7:30 a.m.
5. Pile driving operations shall be confined to the period between 8:30 a.m. and 4:30 p.m., Monday through Friday. Pile driving will not be permitted on weekends and legal State and Federal holidays.
6. All internal combustion engine-powered equipment shall have mufflers to minimize noise and shall be properly maintained to reduce noise to acceptable levels.
7. Noise and vibration levels shall be monitored by the Contractor at stations approved by the Engineer.

F. Erosion Control:

1. The contractor shall incorporate all erosion control measures by employing Best Management Practices (BMPs). The BMPs may be modified as necessary to adjust to conditions that develop during construction.
2. Except for specified measures which are shown in the Plans, the Contractor shall determine the appropriate erosion control measures to use. Such work may involve the construction of temporary berms, dikes, dams, sediment basins, and silt fences and the use of temporary mulches, mats, and gravel blankets, or the construction and use of other control devices or methods as necessary to control erosion.
3. Drainage outlets shall be maintained to minimize erosion and pollution of the waterways during construction. Surface runoff waterways during

construction. Surface runoff shall be controlled in order to minimize silt and other contaminants entering the water. Should excessive siltation or turbidity result from the Contractor's method of operation, the Contractor shall install silt curtains or other silt contaminant devices as required to correct the problem. Such corrective measures shall be at no additional cost to the State.

4. The work areas and haul roads, including roadways leading to the project site, shall be continuously watered to prevent the generation of dust and shall be cleaned daily to remove all mud and droppings from construction vehicles. Mud shall be removed from the tires of all vehicles before leaving the construction site.
5. 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 basin unless treated to comply with the State Department of Health water pollution regulations.
6. Trucks hauling debris shall be covered as required by PUC Regulation. Trucks hauling fine materials shall be covered.
7. 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.
8. During interim grading operations, the grade shall be maintained so as to preclude any damage to adjoining property from water and eroding soil.
9. 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.
10. Drainage outlets and silting basins shall be constructed and maintained as directed by the Engineer to minimize erosion and pollution of waterways during construction.
11. No dumping of waste concrete will be permitted at the job-site.
12. 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.

13. When spray painting is allowed such spray painting shall be done by the “airless spray” process. Other types of spray painting will not be allowed.

G. 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 cost incurred by the State in taking such action from monies due to 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 INTERIM 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 INTERIM GENERAL CONDITIONS.

1.05 ENVIRONMENTAL PROTECTION REQUIREMENTS:

- A. Provide and maintain, during the life of the contract, environmental protection as defined. Plan for and provide environmental protective measures to control pollution that develops during normal construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Comply with Federal, State, and local regulations pertaining to the environment, including but not limited to water, air, and noise pollution.
- B. Dust Control: Take into consideration the requirements of Hawaii Administrative Rules, Title 11, Chapter 60.1 (HAR 11-60.1) to prevent the release of dust from construction operations, including but not limited to sandblasting. Submit a plan

for containment measures (plastic or canvas screens, vacuum attachments, etc.) of dust emission for approval by the Engineer.

C. Storm Water Pollution Control: Implement applicable Best Management Practices to prevent contamination of storm water from all areas affected by construction. Best Management Practices include, but are not limited to the following:

1. Performing regular cleaning to keep areas exposed to storm water clean and free of rubbish, construction debris, spills, etc.
2. Storing material under shelter or covering material to avoid contact with storm water.
3. Enclosing outdoor sanding and painting operations to contain and collect waste.
4. Frequently vacuuming/cleaning waste from sanding and painting operations.
5. Providing a berm or dike around critical areas. Berm shall be lined with 30 mils thick (minimum) polyethylene sheeting and covered with 10 mils thick of polyethylene sheeting. The polyethylene sheeting shall be secured and maintained. Provide run-on and runoff controls to prevent leachate discharge to the surrounding area and maintain the polyethylene sheeting until the contaminated material is disposed of at a permitted facility. Load and haul contaminated materials in canvas covered trucks.
6. Controlling spills, etc.

1.06 MEASUREMENT AND PAYMENT:

The cost for any environmental permits and pollution control activity specified above and in the plans shall include all equipment, labor, and material necessary to complete the work in place and shall be paid for under the Lump Sum for “Best Management Practices, erosion control, stormwater runoff control, and environmental protection” in the Proposal Schedule.

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  
01581-2



## SECTION 02070

### SELECTIVE DEMOLITION AND REMOVAL

#### PART 1 – GENERAL

##### 1.01 GENERAL CONDITIONS

- A. As specified in Division 1 – General Requirements.

##### 1.02 WORK SPECIFIED IN THIS SECTION

- A. This section includes performing all operations and furnishing all equipment necessary to accomplish all demolition and removal work indicated on the drawings or as required for reception of the scheduled new construction.

##### 1.03 WORK SPECIFIED IN OTHER SECTIONS

- A. All renovation, repair or replacement work required as the result of removal operations shall be accomplished under the applicable section of these specifications.

#### PART 2 – PRODUCTS

(Not used)

#### PART 3 – EXECUTION

##### 3.01 DEMOLITION AND REMOVAL

###### A. Condition of Premises

1. The Contractor shall examine the site and become familiar with the existing conditions and the amount and kind of work to be performed.

###### B. Protection

1. Throughout the progress of the work protection shall be provided for all property and equipment, and temporary barricades shall be provided as necessary. Work shall be done in accordance with the safety provisions of the Manual of Accident Prevention in Construction, published by the Associated Contractors of America. Any damages will be repaired or replaced by the Contractor to the satisfaction of the DLNR at no additional cost to the state.

###### C. Dust Control

1. Take appropriate action to minimize the spread of dust to occupied portions of the parking lot and harbor, 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.

D. Fires

1. No burning of fires of any kind will be allowed.

E. Reference Point

1. Bench marks, etc., shall be carefully maintained, but if disturbed or destroyed, shall be replaced as directed at the Contractor's expense.

3.02 EXISTING FACILITIES TO BE REMOVED

- A. Remove existing bollards, boulders, pavement, utility piping, and signs as indicated on the plans.

B. Disposal

1. All removed materials with no salvage value shall be removed from the premises. All removed material with salvage value as determined by the DLNR shall be neatly stored on the premise as directed by the Engineer.
2. Excessive accumulation of debris, rubbish and dirt will not be permitted. All material or debris shall be removed regularly from the site. A fog spray or other dust settling method shall be employed to dampen areas where there is excessive dust and dirt.
3. Whenever directed by DLNR, the Contractor shall provide barricades, construct fences or other means to fully protect the public or adjacent properties from injury. Protect, as required, or cap off existing underground utility lines, if uncovered.
4. The Engineer shall be notified immediately should the removal of any item reveal concealed deterioration or structural failure.
5. All demolition work shall be executed in a manner with the least disturbance to existing work or impairing the strength of remaining structures. Provide temporary supports as necessary.
6. All materials to be later reused shall be carefully removed, inspected by the Engineer and neatly stored away. Items damaged during the removal work

shall be replaced with new of the matching type, size and shape at no cost to the state.

C. Regulations

1. Comply with Federal, State and local hauling and disposal regulations.

END OF SECTION

## SECTION 02073

### PATCHING

#### PART 1 – GENERAL

##### 1.01 GENERAL CONDITIONS

- A. As specified in Division 1 – General Requirements.

##### 1.02 GENERAL REQUIREMENTS

- A. Furnish all materials, labor and equipment necessary to accomplish all patching work as required and specified herein.
- B. In addition, the following construction standards, with certain modifications as hereinafter specified, are hereby incorporated into and made a part of these specifications by reference and shall be applicable to all work performed by the Contractor under this section.

- 1. Specific Sections of the Counties' STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION dated September 1986 and STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION dated September 1984 as revised, except as amended in the plans and/or specifications herewith. (Paragraph concerning Measurements and Payments in the Sections are not applicable to this project.

Restoring Pavements and Other Improvements: Section 38.

Concrete Curb: Section 41.

#### PART 2 – PRODUCTS

##### 2.01 GENERAL

- A. No asbestos containing materials shall be under this section. The Contractor shall insure that all materials incorporated in the project are asbestos-free unless specifically approved in writing by the Engineer.

##### 2.02 MATERIALS

- A. All materials used for patching work shall be new and of grade compatible with the existing material and acceptable to the DLNR. All materials shall be of their respective kind and such that when they are installed or applied the finish of the

new material shall match that of the adjoining existing surfaces of the similar material.

### PART 3 – EXECUTION

#### 3.01 GENERAL PATCHING

- A. Cavities and/or openings resulting from excavation or grading work shall be filled and finished to match existing surfaces. Wherever possible, the patchwork shall be in whole units, not in part or parts of a whole.
- B. Patching work shall be accomplished in accordance with the best standard practices of the trade, and by persons skilled in the trade, and in a manner approved by DLNR.

END OF SECTION

## SECTION 02100

### SITE PREPARATION

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

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

##### 1.2 COORDINATION WITH OTHER SECTIONS

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

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

#### PART 3 - EXECUTION

##### 3.1 GENERAL

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

When necessary, the Contractor shall provide and erect barriers, signage, etc., necessary to control traffic, delineate "no-parking" areas, and ensure safety of the public and personnel and protect property and equipment.

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

### 3.2 EXISTING UTILITY LINES

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

### 3.3 CLEARING AND GRUBBING

- A. The Contractor shall clear the premises of all obstacles and obstructions, the removal of which will be necessary for the proper reception, construction, execution and completion of other work included in this contract.
- B. After clearing has been completed, the entire site shall be stripped of the organically contaminated near-surface soils to a minimum depth of 6 inches. Remove trees and roots to a minimum of 3 feet below existing ground level. Remove all large roots in excess of 2 inches in diameter, and backfill and compact the resulting depression. All debris accumulated from this operation shall be completely removed from the premises by the Contractor.
- C. The Contractor shall protect from injury and damage all surrounding trees, plants, etc., and shall leave all in as good as condition as at present. Any damage to existing improvement shall be repaired or replaced by the Contractor to the satisfaction of the Engineer.

### 3.4 CLEAN UP OF PREMISES

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

END OF SECTION

## SECTION 02110

### CLEARING AND GRUBBING

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

This section covers the requirements for clearing and grubbing, within the areas shown on the plan or as directed by the Engineer. The above work shall include the removal and disposal of designated trees outside the clearing limits. Also included is the protection from injury or defacement of trees and other objects designated to remain and treatment or removal of damaged trees.

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

#### PART 3 - EXECUTION

##### 3.1 CLEARING AND GRUBBING WORK:

- A. The area to be cleared shall be to the dimensions shown on the plans or one foot beyond toe of fill and top of cut whichever is greater.
- B. All debris, trees, logs, limbs, branches, brush, plants, and other protruding obstructions within the clearing limits shall be removed and disposed of, except the following:
  - 1. Live, sound, and firmly rooted trees with diameter of 4 inches or larger, unless otherwise indicated on the drawings.
- C. Except as provided above, all limbs and branches more than 1/2 inch in diameter that extend into the cleared area shall be cut flush with the tree trunks or stems or cut at the ground surface.
- D. Felling, cutting, and trimming methods shall not cause bark damage to standing timber. If damage does occur to standing trees, the injured area shall be treated with a coat of tree-surgery asphalt-based paint. Trees with major roots exposed by construction that are rendered unstable shall be felled and disposed of as specified herein.
- E. All stumps within the project site shall be removed. Stumps located between the edge of the project site and clearing limits that cannot be cut flush with the finished slope, or are not tightly rooted, shall be removed.

- F. Debris from clearing and grubbing operations shall be removed from the project site and properly disposed of in accordance with Federal, State, and Local hauling regulations. Debris shall not be placed in streams, water courses, the ocean water, or at locations that will impede flow of the natural drainage pattern. Stockpiling of material may be allowed on the site pending advanced coordination and approval by the Engineer.

END OF SECTION

## SECTION 02226

### ROADWAY EXCAVATION

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

Roadway excavation shall consist of the removal and proper disposal of all materials necessary and required for the formation of the roadway prism, including the construction of the roadbed, parking lot, embankments, subgrade, the removal and disposal of surplus or unsuitable material, and the necessary excavation for the installation of gutters, and retaining wall along the right-of-way. It shall also include all of the above work necessary in connection with intersections, side roads, private roadways, approaches and the refilling of excavations caused by the removal of structures, tree roots, and the replacement of unsuitable material.

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

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

#### PART 3 - EXECUTION

##### 3.1 INSTALLATION

- A. Roadway excavation shall be done to the required subgrade to accept the new pavement structure. Subgrade shall be compacted with on-site excavated material approved by the Engineer when filling is required to bring the subgrade elevation to its required height. Subgrade preparation shall conform to the requirement as follows:
  - 1. Preparation. In advance of setting line and grade stakes, the subgrade area shall be cleared of brush, weeds, vegetation, and debris, all of which shall be satisfactorily disposed of to the satisfaction of the Engineer. All depressions and ruts which contain water shall be drained.

All unsuitable material, such as adobe, muck, expansive clay and materials with debris or organic matter, encountered above the road subgrade, shall be removed and hauled away from the project site. Unless a specific site is designated in the special provisions for disposal of unsuitable material, the Contractor is responsible to find a convenient site. The hauling and disposing of the unsuitable material shall be considered as incidental to the excavation work. The Engineer shall determine if the material is unsuitable.

2. Finished Subgrade. The finished subgrade shall have a density of at least 95% of its maximum density for a depth of 6 inches or more. The surface shall be rolled until the material does not creep under the roller and finished smooth to the required grade and cross section.
3. Protection of Subgrade. The subgrade shall be shaped and sloped to drain.
4. Surface Tolerance. The finished subgrade upon which subbase or base course is placed shall not vary more than 0.10 foot above or below the theoretical grade.

All unnecessary traffic shall be kept off the prepared subgrade. Should it become necessary to haul materials and aggregate over the prepared subgrade, the Contractor shall drag and roll the traveled way as frequently as may be necessary to remove ruts, cuts and breaks in the surface. The surface shall be brought up to grade, compacted and rolled smooth before placing the subsequent layer of specified material.

Should the prepared subgrade become soft, spongy, or yielding due to the weather or excessive sprinkling, the Contractor shall at his own expense remove and replace the soft material or let it dry out sufficiently, then recompact the material to the required density and grade.

END OF SECTION

SECTION 02230

AGGREGATE BASE COURSE

PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. Description. This work shall consist of furnishing and placing one or more courses of aggregate base on a prepared surface in accordance with the requirements of the contract.

PART 2 - PRODUCTS

2.1 MATERIALS

Materials shall meet the requirements specified in the following Subsections of Division 700 Materials of the "Standard Specifications for Road and Bridge Construction."

Aggregate	703.06
Aggregate – Bed Course Material for Crushed Rock Cradle	703.16
Water	712.01

PART 3 - EXECUTION

3.1 CONSTRUCTION REQUIREMENTS

A Placing

1. The base material shall be placed on the prepared surface without segregation. Segregated materials shall be remixed until a uniform distribution is obtained. The material shall not be dumped in piles on the prepared surface.
2. Depositing and spreading shall commence at that part of the work farthest from the point of loading the material and shall progress continuously without breaks, unless otherwise directed by the Engineer.
3. If the required compacted depth of the base course exceeds 6 inches, the base shall be constructed on 2 or more layers of approximately equal thickness. The maximum compacted thickness of any one layer shall not exceed 6 inches.
4. If the contractor uses a vibratory roller weighing 9 tons or more, the lift thickness may be increased to 7 inches.

5. Spreading of binder material over the surface of the compacted base will not be permitted. Additional material if required shall be incorporated uniformly throughout the thickness of the compacted material by scarifying and blading. The combined material shall meet all quality requirements as specified.

B. Shaping and compacting

1. The Contractor shall perform such shaping work as necessary and such that the finished base shall conform to the required grade and cross-section. The finished base where not controlled by adjacent structures or features shall not vary more than 0.04 foot above or below the theoretical grade.
2. Compaction of each layer shall continue until a density of not less than 95 percent of the maximum density, determined in accordance with the requirements of Subsection 106.09 - Special Test Methods, of the "Standard Specifications for Road and Bridge Construction, has been achieved. Field density determination will be made in accordance with Hawaii Test Method HWY-TC 1. The surface of each layer shall be maintained during the compaction operations in such a manner that a uniform texture is produced and the aggregates firmly keyed. Water shall be uniformly applied over the base materials during compaction in the quantity necessary for proper consolidation.
3. Should high or low spots develop during rolling operations, such spots shall be smoothed out by blading with a self-propelled and pneumatic-tired motor grader having a wheel base not less than 15 feet long and a blade not less than 10 feet long.
4. Each layer shall be compacted initially by rolling with three-wheel rollers followed by intermediate rolling with pneumatic-tired rollers. Final rolling shall be done with three-wheel rollers.

- C. Equipment. Three-wheel rollers and pneumatic-tired rollers shall conform to the requirements specified in Subsection 401.03(B)(4) - Rollers.

END OF SECTION

## SECTION 02300

### EARTHWORK

#### PART 1 – GENERAL

##### 1.01 GENERAL CONDITIONS

- A. As specified in Division 1 – General Requirements.

##### 1.02 GENERAL REQUIREMENTS

- A. Furnish materials, labor and equipment required to accomplish all excavation, ripping and proofrolling, probing and grouting, filling and backfilling, grading and compacting as indicated on the drawings.
- B. The Geotechnical engineer shall be present to observe site grading, proofrolling, fill and backfill placements and compaction and probing and grouting procedures on a full-time basis. All cost for their services shall be borne by the Contractor.
- C. It shall be the responsibility of the Contractor to examine the site and determine for himself the existing conditions.
- D. Obvious conditions of the site existing on the date of the bid opening shall be accepted as part of the work, even though they may not be clearly indicated on the drawings and/or described herein or may vary there from.
- E. The requirements in this section are applicable to all new construction areas and to future construction areas under this contract.
- F. In addition, the following construction standards, with certain modifications as hereinafter specified, are hereby incorporated into and made a part of these specifications by reference and shall be applicable to all work performed by the Contractor under this section.

##### 1.03 STANDARD SPECIFICATIONS

- A. Work shall be in accordance with the following sections of the County's "Standard Specifications for Public Works Construction" (SSPWC), dated September 1986 as revised, except as amended in the plans and specifications herewith. (Paragraphs concerning Measurement and Payment in the Sections are not applicable to this project.)

1. Clearing and Grubbing

Section 10

2. Trench Excavation and Backfill	Section 11
3. Rock for Fill	Section 14
4. Crushed Rock	Section 15
5. Borrow	Section 16
6. Embankment	Section 17

#### 1.04 CRITERIA FOR BIDDING

##### A. Base bids on the following criteria:

1. Surface elevations are as indicated.
2. Blasting is not permitted.
3. Crushing and screening of onsite rock material for general fill is permitted.
4. Removal of all unsuitable materials as well as additional embankment materials required for lava tubes, and subterranean voids shall be incidental items to excavation and embankment, The Contractor shall adjust his unit price accordingly.

#### 1.05 PERMITS

- ##### A. The contractor shall obtain and pay for necessary permits prior to the commencement of work.

#### 1.06 CONSTRUCTION LINES, LEVELS, AND GRADES

- ##### A. The Contractor shall verify all lines, levels, elevations and improvements indicated on the drawings before any clearing, excavation or construction begins. Any discrepancy shall be immediately brought to the attention of the Engineer and any change shall be made in accordance with his instruction. Starting of clearing and grubbing operations shall be construed to mean that the Contractor agrees that the existing grades and improvements are essentially correct as shown. The Contractor shall not be entitled to extra payment if existing grades and improvements are in error after his verification thereof, or if he fails to report the discrepancies before proceeding with any work whether within the area affected or not.
- ##### B. All lines and grades shall be verified and established by a Surveyor or Civil Engineer licensed in the State of Hawaii.

- C. The laying out of base lines, establishment of grades and staking out the entire work shall be done by a licensed Surveyor or licensed Civil Engineer.

## PART 2 – PRODUCTS

### 2.01 MATERIALS

- A. No asbestos containing materials shall be under this section. The Contractor shall insure that all materials incorporated in the project are asbestos-free.
- B. Fill areas of the project site shall be capped with a minimum 2-foot thick layer of structural fill material. Structural fill shall be well graded granular material, with particles less than 6 inches in maximum size and contain less than 30 percent particles passing the No. 200 sieve by weight. When placed in confined areas, such as utility trenches and footing excavations the maximum particle size shall be limited to 2 inches.
- C. Fill and backfill materials below the minimum 2-foot thick structural fill layer may consist of general fill material. General fill material shall be well-graded granular material, free from organic material and backfill, debris, other deleterious substances and majority of which are less than 12 inches in size with an absolute maximum dimension of 18 inches. Materials between 12 and 18 inches in particle size should be limited to about 15 percent or less of the total volume Cushion fill: Under exterior and interior concrete slabs-on-grade shall be ASTM C33 Standard Size Aggregate No. 67 (No. 3B fine gravel).
- D. Drain rock shall meet the gradation requirements for ASTM C33 Standard Size No. 67 (No. 3B fine gravel).
- E. Base Course and Subbase Course for roadways shall meet the requirements of the Standard Specifications for Public Works Construction, Section 30-Select borrow for Subbase Course and Section 31-Aggregate Base Course.
- F. The Contractor shall import all necessary material to complete the grading work at no additional cost to the Owner. Imported material shall be well-graded from coarse to fine with no particles greater than 6 inches in largest dimension. The material shall have a laboratory California Bearing Ratio (CBR) value of 20 or higher, and a swell potential of 1 percent or less when tested in accordance with ASTM Test Designation D 1883. The imported material shall be tested prior to being transported to the site and subject to the approval of the Geotechnical engineer and shall meet the requirements as specified for each category of the materials.
- G. Excavated onsite basalt materials may be used as fill and backfill, provided that the materials are well graded and maximum size of the individual fragments are

limited to the applicable sizes for general fill and backfill and structural fill and backfill.

### PART 3 – EXECUTION

#### 3.01 PROTECTIVE MEASURES

- A. All excavation shall be protected and guarded against danger to life, limb and property in accordance with applicable regulations
- B. Shoring, as required to safely preserve the excavations, existing electrical handhole boxes, earth banks, etc. free from damages resulting from the work, shall be designed, provided and installed by the Contractor.
- C. All excavations shall be kept free from standing water. The Contractor shall do all pumping and draining that may be necessary to remove water to the extent required in carrying on work. Grading shall be controlled so that the ground surface is properly sloped to prevent water run-off from entering open trenching excavations.
- D. The Contractor shall conduct operations with minimum interference to streets, driveways, sidewalks, passageways, traffic, etc. The Contractor shall confine all work, equipment, materials and personnel as much as possible to the work area as indicated. The Contractor shall schedule all work that involves excessive noise, dust, dirt, or any other detrimental aspect of this work in order that there will be minimum disruptions to neighbors. When necessary and when directed, the Contractor shall provide and erect barriers, etc. with special attention to the protection of personnel.

#### 3.02 LAYING OUT

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

#### 3.03 SITE GRADING

- A. All grading work shall be performed in conformance with County of Hawaii Ordinance 168, the applicable provisions of Chapter 54, Water Quality Control

Standards, and Chapter 55, Water Pollution Control, of Title 11, Administrative Rules of the State Department of Health. In addition, the work shall be in conformance with the Air Pollution Control Standards and Regulations of the State Department of Health.

- B. The area to be graded shall be cleared of vegetation, debris, rubbish, old pavements, abandoned pipelines and other deleterious materials. Trees and large masses of roots shall be grubbed. All of these materials shall be removed and disposed of properly off-site at no cost to DLNR.
- C. No blasting will be permitted.
- D. The areas not covered by concrete slab or pavement up to the Contract Zone Limits shall be graded to conform to finish contours with allowance for depth of top soil. Rough grading shall prevent the drainage of water into construction areas.
- E. Site grading observations shall be performed under the observation of the Geotechnical Engineer.

#### 3.04 SITE PREPARATION

- A. Prior to commencement of earthwork operations, all vegetation debris and other deleterious materials shall be removed from the site. Surface soils shall be stripped until basalt rock is encountered. Strippings shall not be used and shall be removed from the site.
- B. Basalt rock under slab-on-grade pavements, excavated subgrades and areas to receive fill shall be ripped and proofrolled as specified herein.
- C. All subgrades of fill areas shall be scarified a minimum of 8" below subgrade elevations. As a minimum scarifying should extend at least 3 feet laterally beyond the limits of the fill areas.
- D. After the fill surfaces have been scarified, the ground should be proof-rolled with a Caterpillar D-10 bulldozer or similar size bulldozer a minimum of four passes to provide a relatively level surface. After leveling with the bulldozer, the fill subgrades should be Proof-rolled with a large vibratory drum roller (minimum 20 tons static weight) for a minimum of eight passes travelling no faster than 100 feet per minute. Yielding areas, loose areas, or cavities disclosed during clearing and proof-rolling operations should be over-excavated and backfilled with compacted fill materials.
- E. The Geotechnical engineer shall be present from the beginning of grading to observe earthwork operations. In addition, prior to placing fill, the ground surface shall be checked by the Geotechnical engineer.

- F. Any underground structures such as cesspools, cisterns, septic tanks, well, pipelines, fuel tanks, etc. discovered in the site preparation work shall be removed and backfilled in accordance with these specifications and any applicable regulations.
- G. Cut slopes in hard basalt rock may be inclined at 0.50 horizontal to 1.0 vertical or flatter. Benching may be omitted for cut slopes less than 25 feet in height in hard basalt formation. The upper 5 feet of the cut slopes shall be inclined at 1.0 horizontal to 1.0 vertical or flatter.
- H. Any loose soft spots encountered at the excavated subgrade levels shall be removed and replaced with compacted structural fill.

### 3.05 GENERAL FILL AND BACKFILL

- A. Generalfill and backfill shall be compacted to a firm, unyielding surface. Conventional compaction testing is generally not practicable in fills which composed of rocks, boulders and/or cobbles. A testing program to evaluate the number of passes of a compactor needed to achieve the desired level of compaction shall be conducted at the start of the grading phase of the project. Compaction shall be observed by the Geotechnical engineer.
- B. General Fill slopes shall not be steeper than 1.5 horizontal to 1 vertical. Fills placed on slopes steeper than 5H:1V should be keyed and benched into the existing slope to provide stability of the new fill against sliding.
- C. The filling operations shall start at the lowest point and continue up in level horizontal compacted layers in accordance with the fill placement recommendations noted herein before. Fill slopes should be constructed by overfilling and cutting back to the design slope ratio to obtain a well-compacted slope face. In the event that over-cutting of a slope occurs, keying and benching requirements should be implemented instead of backfilling the slope to the design grade with sliver fills.

### 3.06 UTILITY TRENCH EXCAVATION AND BACKFILL FOR EXTERIOR UTILITIES

- A. Trench excavation for exterior utility lines (water, sewer, drain, electrical), shall be dug to depths shown on the drawings. If depths are not indicated, the trench shall be cut down to proper levels that will provide the minimum coverage required.
- B. Trenching work shall be open cut excavation with banks as nearly vertical as practical, with sufficient width to provide proper working space and bottom of trench accurately graded to provide uniform slope and support.

- C. Backfill for the utilities shall be as indicated on the plans and as specified herein. Trench backfill shall be General Fill and Backfill. The upper portion of the trench backfill shall consist of granular material generally less than 6 inches in maximum size compacted to at least 90 percent relative compaction as determined by ASTM D1557-91. For trenches located in paved areas, the upper 2 feet of the trench backfill below the road subgrade shall be compacted to not less than 95 percent relative compaction. Where the utility line crosses beneath the footings, the utility pipes should be concrete jacketed."

### 3.07 FILL TESTING

- A. All fill shall be tested by Geotechnical engineer or a designated testing agency for approval. All cost of testing shall be borne by the Contractor. Testing shall be made throughout the area for each compacted lift. All test results must be approved before the Contractor can proceed with placing of topsoil, cushion fill or base course.

### 3.08 FINISH GRADING

- A. Where finish grades and contours are not given, Contractor shall grade to provide drainage away from new and existing structures and shall provide good transitions into existing grades outside the grading limits

END OF SECTION

## SECTION 02362

### SOIL TREATMENT FOR VEGETATION CONTROL

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

The work to be performed under this section shall include spraying weed killer on the prepared roadway subgrade prior to installation of the base course and where called on the plans and on existing growth prior to application of asphalt in the case of resurfacing jobs.

##### 1.2 SUBMITTALS

Prior to the start of work, the contractor shall submit to the Engineer the material product data and Material Safety Data Sheets for the material proposed for use.

#### PART 2 - PRODUCTS

##### 2.1 MATERIALS

- A. Weed killer shall be "Casoron 4G", "Norosac 4G", or an approved equal for under asphalt application on new or rebuilt pavement.
- B. Weed killer shall be "Hyvar X", "Roundup" or approved equal for application to existing weeds for resurfacing jobs.

#### PART 3 - EXECUTION

##### 3.1 APPLICATION

- A. The under asphalt weed killer shall be mixed and uniformly spread using calibrated application equipment at the maximum rates permitted for "under asphalt" use and in strict accordance with the manufacturer's label. Base Course material shall be installed as soon as possible after applying the weed killer to preclude loss of germination inhibiting action.
- B. In treatment of existing growth on resurfacing jobs, the weed killer shall be mixed and uniformly sprayed in strict accordance with the manufacturer's label. The edges of all resurfacing areas shall be treated a minimum of 2 feet from edge of pavement.
- C. Nut grass shall be retreated two (2) days after initial application and again if growth still exists.
- D. The Contractor shall notify the Engineer 24 hours before application of weed killer.

END OF SECTION

SECTION 02512

ASPHALTIC CONCRETE PAVING

PART 1 – GENERAL

1.01 GENERAL CONDITIONS

A. As specified in Division 1 – General Requirements.

1.02 GENERAL REQUIREMENTS

A. Furnish materials, labor and equipment required to accomplish all asphaltic concrete paving as indicated on the drawings.

PART 2 – PRODUCTS

2.01 MATERIALS

A. No asbestos containing materials shall be under this section. The Contractor shall insure that all materials incorporated in the project are asbestos-free.

B. Materials shall be in accordance with the following sections of the County's "Standard Specifications for Public Works Construction" (SSPWC), dated September 1986 as revised, except as amended in the plans and specifications herewith. (Paragraphs concerning Measurement and Payment in the Sections are not applicable to this project.)

- |                                     |            |
|-------------------------------------|------------|
| 1. Subgrade                         | Section 29 |
| 2. Select Borrow for Subbase Course | Section 30 |
| 3. Aggregate Base Course            | Section 31 |
| 4. Asphalt Surface Treatment        | Section 33 |
| 5. Asphalt Concrete Pavement        | Section 34 |

C. Mix shall be State Mix No. 4 for all work.

D. Weed killer shall be applied to the subgrade per Specification Section 02362.

PART 3 – EXECUTION

3.01 INSTALLATION

- A. The Contractor shall stake out the areas to be paved, using grade stakes on which the final finish elevations, base course and subgrade elevations are clearly marked.
- B. Weed killer shall be applied to the subgrade prior to placement of base course. Reference Specification Section 02362.

3.02 REPAIR OF EXISTING AC PAVEMENTS

- A. Any existing asphaltic concrete pavements including roads and walkways have been damaged by construction activities shall be repaired to the original condition and to the satisfaction of DLNR. Damage done by heavy equipment, especially on roads and yards not stable for such equipment, shall be repaired to the original condition and to the satisfaction of the Engineer.

END OF SECTION

## SECTION 02513

### PRIME COAT

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and installing of prime coat.

#### PART 2 - PRODUCTS

##### 2.1 MATERIALS

- A. Bituminous Material: Bituminous material for prime coat shall be a medium curing liquid asphalt, Grade MC-30, conforming to the applicable requirements of Section 702 - Bituminous Materials, State of Hawaii, Department of Transportation "Standard Specifications of Road and Bridge Construction."

The Contractor shall submit a Certificate of Compliance accompanied by test data, conforming to the requirements of ASTM M82-75 Cut-Back Asphalt (Medium Curing Type), for each lot or batch of MC-30. Medium curing liquid asphalt, grade MC-30 will not be accepted without adequate documentation.

The Engineer reserves the right to waive any of the requirements for the MC-30 provided that its performance is not affected.

#### PART 3 - EXECUTION

##### 3.1 DETAILS

- A. Immediately before applying the prime coat, the surface to be treated shall be swept clean of all loose material, dirt, excess dust or other objectionable material.

Prime coat shall not be applied when the surface to be treated is appreciably damp or when weather conditions are unsuitable.

- B. The material shall be uniformly applied by a vehicle, mounted, pressure operated, sprayer type distributor at an approximate rate of 0.35 of a gallon per square yard. The exact rate of application shall be determined by the Engineer. After the prime coat has penetrated the surface, deficient areas shall receive additional applications and areas of excess bituminous material shall be blotted with clean sand. Traffic shall be kept off the prime coat until the material has been completely absorbed.

- C. Curbs, sidewalks and gutters shall be protected from prime coat. Any material sprayed on adjoining improvements shall be immediately cleaned off. The edges of existing asphalt paving, manholes and catch basin frames, concrete gutters, etc., against which asphaltic concrete pavement is to be placed shall be given a prime coat.

END OF SECTION

## SECTION 02514

### TACK COAT

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and installing bituminous tack coat.

#### PART 2 - PRODUCTS

2.1 All sections or subsections called for in the specifications shall be referred to the State of Hawaii, Department of Transportation, "Hawaii Standard Specifications for Road and Bridge Construction," 1985.

##### 2.2 MATERIALS

Bituminous material for tack coat shall be slow-setting emulsified asphalt, Type SS-1 or Type SS-1H, conforming to the applicable requirements of Section 407 - Bituminous Tack Coat.

Water shall conform to the requirements of Subsection 712.01 - Water.

#### PART 3 - EXECUTION

##### 3.1 CONSTRUCTION REQUIREMENTS

- A. Weather Limitations: Tack coat shall not be applied on a wet surface or when weather conditions otherwise shall prevent proper construction.
- B. Equipment: The Contractor shall provide equipment for heating and applying the bituminous material. This equipment shall meet the requirements of Subsection 405.03(B) - Equipment.
- C. Preparation of Surface: Immediately before applying the tack coat, the surface to be treated shall be swept clean of all loose material, dirt, excess dust or other objectionable matter. A power broom or power blower, supplemented by hand methods if necessary, shall be used.
- D. Application of Bituminous Material: The emulsified asphalt shall be diluted with water at a rate of one part emulsion to one part of water by volume. The quantity, rate of

application, temperature, and areas to be treated will be approved prior to application.

Tack coat shall be placed only so far in advance of the surface course placement as is necessary for it to cure to the proper condition for placement of such surface course.

Unless otherwise specified, tack coat shall be applied at the rate of 0.05 - 0.15 gallon per square yard on surface of base course.

Tack coat will not be measured for payment. Tack coat will be considered as incidental to the various contract items.

END OF SECTION

Tack Coat  
02514-2

Section 02577

PAVEMENT MARKINGS

PART 1 – GENERAL

1.01 GENERAL CONDITIONS

- A. As specified in Division 1 – General Requirements.

1.02 GENERAL REQUIREMENTS

- A. Furnish materials, labor and equipment required to accomplish pavement markings as indicated on the drawings.

1.03 SUBMITTALS

- A. Submit manufacturer's product data and application instructions.

1.04 DELIVERY AND STORAGE

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

PART 2 – PRODUCTS

2.01 MATERIALS

- A. No asbestos containing materials shall be under this section. The Contractor shall insure that all materials incorporated in the project are asbestos-free.
- B. Paint: Non-reflective conforming to Fed. Spec. TT-P-102, color as indicated on the drawings or as selected by DLNR.
- C. Retroreflective Thermoplastic Compound Pavement Markings
  - 1. Retroreflective thermoplastic compound pavement markings shall conform to AASHTO M 247 and AASHTO M 249.
  - 2. Pigment, beads, and filler shall be uniformly dispersed in the resin. Material shall be free from skins, dirt, foreign objects, and ingredients that cause bleeding, staining, or discoloration, or combination thereof, and shall conform to Table 1 Composition Requirements.

TABLE 1 – COMPOSTION REQUIREMENTS		
Component	White	Yellow
Binder (percent minimum)	18	18
Titanium Dioxide (TiO2) Pigment (percent minimum)	10	N/A
Glass Beads (percent by weight)	30-40	30-40
Yellow Pigment	N/A	See Note*
Calcium Carbonate Filler (percent maximum)	42	48
* Note: Amount of yellow pigment, calcium carbonate, and inert fillers shall be at manufacturer's option, provided that all other requirements of these specifications are met. Yellow pigment used shall not contain materials listed under the Resource Recovery and Conservation Act (RRCA), including lead, cadmium, mercury, and hexavalent chromium. Total content of these materials in striping compound shall not exceed 100 parts per million.		

3. Glass beads shall conform to the following requirements:
  - a. Have minimum refractive index of 1.50 when tested by liquid immersion method at  $77 \pm 9$  degrees F, an minimum 70 percent true spheres, and be free from air inclusions.
  - b. Have standardized Type I gradation as specified in Table 2 - Glass Bead Gradation.

TABLE 2 - GLASS BEAD GRADATION	
U.S. Sieve Number	Percent Passing
20	100
30	75-95
50	15-35
100	0-5

- c. At least 70 percent of spheres shall conform to the following requirements:
      - i) Surfaces of spheres shall be smooth, lustrous, and free from film scratches and pits
      - ii) Spheres shall be clear, transparent, and not ovate in shape or fused.

- iii) Spheres shall show high auto collimating efficiency, with less than 1 percent of spheres black, amber, or milky.
4. Thermoplastic material shall conform to the following requirements:
- a. Material shall be a maleic-modified glycerol ester resin (Alkyd-based) compound designed for traffic markings.
  - b. Material shall not be slippery, once installed.
  - c. Material shall not deteriorate by contact with sodium chloride, calcium chloride, oil content of pavement materials, or oil droppings from traffic, before warranty period has expired.
  - d. Material shall not be volatile, shall not give off fumes in application state, and shall not be toxic, noxious, or injurious to persons or property.
  - e. Material shall not break down or deteriorate if held at application temperature for 4 hours, or if reheated to application temperature three times.
  - f. Material shall not discolor as result of up to three reheatings, or vary in color from batch to batch.
  - g. Material shall not change color and brightness characteristics after prolonged exposure to sunlight.
5. Application properties of thermoplastic compound shall conform with the following:
- a. Compound shall be machine-applied to pavement and concrete surface in molten state at temperature range of  $412.5 \pm 12.5$  degrees F. Material shall not scorch or discolor if kept at molten state temperatures for up to 4 hours.
  - b. After cooling to ambient temperature and without polymerization or other chemical change, compound shall form traffic marking stripe of quality and appearance as specified herein.
  - c. Material shall show no appreciable deformation or discoloration under local traffic conditions and in ambient or pavement temperatures ranging from 0 degrees F to 120 degrees F.
  - d. Drying time is defined as minimum elapsed time from marking application to time after which normal local traffic leaves no impression or imprint on

applied marking, and after which stripe attains and retains required characteristics, including thickness.

When applied at temperature range of  $412.5 \pm 12.5$  degrees F and thickness of 1/8 inch to 3/16 inch, material drying time shall not exceed two minutes when the air temperature is  $50 \pm 3$  degrees F. When air temperature is  $90 \pm 3$  degrees F, drying time shall not exceed 10 minutes

- e. Material shall allow stripe to maintain original dimensions and placement. Exposed surface shall be free from tack. Applied marking shall not chip or debond under normal movement of pavement surface.
- f. Pigment shall be dispersed evenly throughout material. Material shall be of uniform density and character, throughout its thickness.
- g. Material shall not smear or spread at pavement temperatures of 140 degrees F or less.

#### 6. Specifications and Testing

- a. Material color after heating for  $240 \pm 5$  minutes at  $425 \pm 3$  degrees F and cooled to  $77 \pm 3$  degrees F shall meet the following requirements:
  - i) White: Daylight reflectance at 45 degrees to 0 degrees shall be minimum of 75 percent. Chemical analysis of white titanium pigment shall be performed in accordance with ASTM D 1394. Material shall have maximum yellowness index of 15
  - ii) Yellow: Daylight reflectance at 45 degrees to 0 degrees shall be minimum of 45 percent. Yellow color shall match Federal Standard Number 595B, Color 13538.
- b. Material shall have less than 0.5 percent by weight of retained water when tested in accordance with ASTM D 570, Procedure (a).
- c. After heating for  $240 \pm 5$  minutes at  $425 \pm 3$  degrees F, material shall have softening point of  $215 \pm 15$  degrees F when tested in accordance with ASTM D 36.
- d. Material shall have specific gravity of 1.9 to 2.5 when determined in accordance with ASTM D 153, Method A. Kerosene shall be used as immersion liquid. Test sample shall be ground to pass No. 30 sieve.
- e. Material shall have impact resistance of not less than 10 inch-pounds at 77 degrees F when tested as follows:
  - i) Heat material for  $240 \pm 5$  minutes at  $425 \pm 3$  degrees F.

- ii) Cast material into bars of 1 square inch cross-sectional area, 3 inches long.
  - iii) Place material with 1 inch extending above vise in cantilever beam (Izod Type) tester, using 25 inch-pound scale 974 in accordance with ASTM D 256.
- f. Material shall have bond strength of not less than 150 pounds per square inch. Two concrete blocks, 2 inches by 3 inches by 7 inches, shall be cemented together on 3-inch by 7-inch 979 faces with 1/16- to 1/8-inch layer of thermoplastic traffic line material and tested in accordance with ASTM D 4796.
- g. After heating material for  $240 \pm 5$  minutes at  $425 \pm 3$  degrees F, testing in accordance with ASTM D 2240, and taking Shore Durometer readings after 15 seconds, material shall exhibit minimum hardness values, at designated testing temperature, as specified in Table 3 - Indentation Resistance.

TABLE 3 INDENTATION RESISTANCE	
TEMPERATURE	READING
115 degrees F	65
77 degrees F	95
40 degrees F	95

- h. Each unit container shall be marked clearly to show color of material, process batch number or similar manufacturer's identification, manufacturer's name, plant address, and manufacture date. Each batch manufactured shall have its own, unique number. Label shall warn user that material shall be heated to  $412.5 \pm 12.5$  degrees F during application.

Material shall be delivered to designated area in unit containers, such as sacks or bags, as processed by manufacturer; and shall weigh more than 24 pounds but less than 52 pounds, or as ordered by the Engineer.

## 2.02 EQUIPMENT

- A. Painting Equipment: The mechanical marker shall be an atomizing spray-type marking machine suitable for application of traffic paint. It shall produce an even and uniform film thickness at the required coverage and shall be designed so as to apply markings of uniform cross-sections and clear-cut edges without running or spattering and within the limits for straightness set forth herein.

Use wheeled, motor-propelled applicator machine to apply traffic paint at nominal thickness of 0.015 inch or at rate of 300 linear feet of single 4-inch stripe for 1 gallon 150 paint. Use applicator having appropriate shields around nozzles to permit sharp stripe definition, and separate nozzle to direct air stream immediately ahead of paint application for clearing debris, dust, and other foreign matter. Immediately remove misted, dripped, and spattered paint from pavements.

- B. Thermoplastic Extrusion Pavement Marking Equipment: Apply material to pavement by extrusion method. One side of shaping die shall be pavement surface and other three sides shall be contained by, or shall be part of equipment for heating and controlling flow of material.
1. Equipment shall provide continuous mixing and agitation of material. Conveying parts of equipment shall be constructed to prevent accumulation and clogging.
  2. Mixing and conveying parts, including shaping die, shall maintain material at plastic temperature.
  3. Applicator shall cleanly and squarely cut off stripe ends. Pans, aprons, or similar appliances that the die overruns will not be allowed.
  4. Apply beads to entire surface of completed stripe by automatic bead dispenser attached to liner.
  5. Equip bead dispenser with automatic cutoff control synchronized with cutoff of thermoplastic material.
  6. Use equipment that provides for varying die widths to produce varying widths of traffic markings.
  7. Provide kettle for melting and heating composition. Equip kettle with automatic thermoplastic control device so that heating can be done by controlled heat transfer liquid rather than direct flame.
  8. Equip and arrange applicator and kettle in accordance with National Fire Underwriters requirements.
  9. Use mobile and maneuverable applicator that is capable of following straight lines and making curves in true arcs.
  10. Use applicator capable of containing minimum of 125 pounds of molten material.

### PART 3 – EXECUTION

### 3.01 INSPECTION

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

### 3.02 SURFACE PREPARATION

- A. Allow new pavement surfaces to cure for a period of not less than 30 days before application of marking materials. Thoroughly clean surfaces to be marked before application of the paint. Remove dust, dirt, and other granular surface deposits by sweeping, blowing with compressed air, rinsing with water, or a combination of these methods as required. Remove rubber deposits, existing paint markings, and other coatings adhering to the pavement by water-blasting. Scrub affected areas, where oil or grease is present on old pavements to be marked, with several applications of tri-sodium phosphate solution or other approved detergent or degreaser and rinse thoroughly after each application. After cleaning oil-soaked areas, seal with shellac or primer recommended by the manufacturer to prevent bleeding through the new paint.

### 3.03 PAINTING INSTALLATION

- A. Do not apply paint until the layouts, indicated alignment, and the condition of the existing surface has been approved by the Engineer.
- B. Provide guidelines and templates as necessary to control paint application. Take special precautions in marking symbols. Sharply outline all edges of markings. The maximum drying time requirements of the paint specifications will be strictly enforced, to prevent undue softening of bitumen, and pickup, displacement, or discoloration by tires of traffic. Striping widths for lines shall be 4 inches, unless otherwise indicated.
- C. The finished product shall have an opaque, well-painted appearance, with no black or other discoloration showing through.

### 3.04 THERMOPLASTIC INSTALLATION

- A. Clean off dirt, blaze, paint, tape, and grease. Apply thermoplastic extrusion pavement marking only when pavement surface is dry.
- B. Use equipment that can apply material in variable widths from 2 inches to 12 inches. Apply material for full width of stripe in one application or pass.

- C. On concrete pavements, on HMA pavements more than seven days old, and on HMA pavements paved within seven days containing less than 6 percent bituminous asphalt, pre-stripe application area with binder material, primer, or prime seal coat recommended by pavement marker manufacturer.
- D. Line thickness, as viewed from lateral cross section, shall measure not less than 3/32 inch at edges, and not less than 1/8 inch in center.
- E. Provide finished lines with well-defined edges, free of waviness.

3.05 TRAFFIC CONTROL AND PROTECTION

- A. Place warning signs near the beginning of the work site and well ahead of the work site for alerting traffic. Place small markers along newly painted lines to control traffic and prevent damage to newly painted surfaces.

END OF SECTION

## PIPED UTILITY MATERIALS AND METHODS

### PART 1 – GENERAL

#### 1.01 GENERAL CONDITIONS

- A. As specified in Division 1 – General Requirements.

#### 1.02 GENERAL REQUIREMENTS

- A. Whenever the Contractor is required by State or local laws or regulations to make a deposit and/or pay for a permit before proceeding with any work called for under this part of the specifications, the Contractor shall make the necessary deposits and/or pay for obtaining the required permit for the work.
- B. In addition, the following construction standards, with certain modifications as hereinafter specified, are hereby incorporated into and made a part of these specifications by reference and shall be applicable to all work performed by the Contractor under this section.
  - 1. Specific Sections of the Counties' STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION dated September 1986 and STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION dated September 1984 as revised, except as amended in the plans and/or specifications herewith. (Paragraph concerning Measurements and Payments in the Sections are not applicable to this project.
  - 2. WATER SYSTEM STANDARDS, and APPROVED MATERIAL LIST AND STANDARD DETAILS FOR WATER SYSTEM CONSTRUCTION, County of Hawaii, State of Hawaii, 2002.
  - 3. STANDARD SPECIFICATIONS FOR ROAD BRIDGE AND PUBLIC WORKS CONSTRUCTION Department of Transportation, State of Hawaii, latest edition, as amended with deletion of sub-sections related to measurement and payment and as specified herein.

#### 1.03 CERTIFICATION

- A. The Contractor shall furnish to the Engineer affidavits from the manufacturers of pipe, pipe section, fittings, valves, etc. furnished and installed under this section verifying that such materials delivered to the project conform to the requirements of this specification.

### PART 2 – PRODUCTS

#### 2.01 MATERIALS

- A. No asbestos containing materials shall be under this section. The Contractor shall insure that all materials incorporated in the project are asbestos-free.

B. Materials for sanitary sewer system shall be in accordance with the PLUMBING CODE of the County of Hawaii and the below-listed sections of the Counties' STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION dated September 1986 and STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION dated September 1984 as revised, except as amended in the plans and/or specifications herewith. (Paragraphs concerning Measurement and Payments in the Sections are not applicable to this project.)

1. PVC Sewer Pipe and Appurtenances Section 21
2. Sewer Manholes Section 23
3. PVC Force Main PVC, Schedule 80, Solvent Jointed

C. Material for storm drain system shall be in accordance with the PLUMBING CODE of the County of Hawaii and the below-listed sections of the Counties' STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION dated September 1986 and STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION dated September 1984 as revised, except as amended in the plans and/or specifications herewith. (Paragraphs concerning Measurement and Payments in the Sections are not applicable to this project.)

1. Storm Drain Pipes PVC SDR-35
2. Catch Basins and Drywells Section 26

D. Materials for water distribution system shall be in accordance with the current Department of Water Supply's WATER SYSTEM STANDARDS, except that lines less than 4 inches inside diameter shall be soft copper, Type K.

### PART 3 – EXECUTION

#### 3.01 INSTALLATION

A. Location and Adjustment of Existing Utility Lines

1. The Contractor shall be responsible for precisely laying out the various exterior utility lines shown on the contract drawings as provided elsewhere in these specifications. The locations shown on the contract drawings of the various existing utility lines which the new lines are to cross over or under or connect to, were determined on the basis of the best information available; however, no assurance can be provided that the actual locations will be precisely as shown on the contract drawings.
2. In performing all work, the Contractor shall exercise due care and caution necessary to avoid any damage to and impairment in the use of any existing utility lines. Any damage inflicted on existing lines resulting from the Contractor's operations shall be immediately repaired and restored as directed by the Engineer at the Contractor's expense.

B. Excavation and Backfill



## SECTION 02605

### VALVE BOXES, MANHOLES & MARKERS

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

This section shall apply to furnishing and installing valve boxes, manholes and markers. Unless otherwise noted, reference made to the Standard Details shall be the "State of Hawaii Water System Standards, Approved Material List and Standard Details for Water System Construction," Dated 2002 as amended.

##### 1.2 VALVE BOXES

Valve boxes for gate valves, air relief valves and butterfly valves and cleanouts shall be installed in accordance with the Standard Details.

##### 1.3 MANHOLES

Manholes shall be constructed wherever specified on the plans. Manholes shall be constructed in accordance with the Standard Details or as shown on the plans.

Manhole in lieu of valve box shall be constructed over any valve whenever the depth from the finish grade of the pavement or ground to the top of the stem of the valve exceeds five (5) feet unless directed otherwise by the Engineer.

##### 1.4 MARKERS

Valve markers for establishing the location of valves shall be installed at the locations shown on the plans or as directed by the Manager. Markers shall conform to the dimensions and notes shown on the Standard Details.

#### PART 2 - PRODUCTS

##### 2.1 GENERAL

- A. Cast iron for frames and covers shall conform to ASTM Designation A-48.
- B. All castings shall be of tough, close-grained, gray iron, sound, smooth, clean, and free from blisters, blowholes, shrinkage, and cold shuts.
- C. Allowance shall be made in the patterns so that the finished castings shall have the specified dimensions.

- D. The seats of manhole and valve box frames and covers shall be machined, not ground to secure FLAT AND TRUE SURFACES. Castings for Cover and Reading Lid seats shall be chipped and ground where necessary to secure FLAT AND TRUE SURFACES.
- E. All castings shall be thoroughly cleaned and painted before leaving the shop with one coat of high-grade asphaltum.

## 2.2 MANHOLE COVERS AND FRAMES

All manhole covers and frames shall be made in accordance with the dimensions and notes shown on the Standard Details.

## 2.3 MANHOLE RUNGS

Manhole rungs shall be 3/4-inch in diameter, hot-dipped galvanized carbon steel, or stainless steel, Type 302, 304, or 316, or an approved equal.

- A. Rungs shall be fabricated in accordance with the dimensions and notes shown on the Standard Details.

## 2.4 VALVE BOX COVERS AND FRAMES AND STANDPIPES

Valve box covers and frames shall be made in accordance with the dimensions and notes shown on the Standard Details.

Valve box standpipes shall be either cast iron pipe, R.C.P., PVC, or approved equal. Standpipes shall be as shown on the Standard Details.

## PART 3 - EXECUTION

### 3.1 VALVE BOXES

The standpipe shall be set plumb and centered over the valve stem. Backfill around the valve and standpipe shall be made by hand to 8 inches below the surface of the ground and compacted. Compaction of backfill shall be done with approved pneumatic tampers.

The cast iron frame and cover shall set firmly to grade. The 4-inch thick DWS 2500 concrete slab shall be poured to secure the frame.

All cast iron covers shall be close fitting to avoid rattling due to the passing traffic. All defective frames and covers shall be replaced to the satisfaction of the Manager.

Upon completion of installation, valve box frames and covers shall be cleaned and painted with one coat of approved asphaltum paint.

Existing valve boxes to be reconstructed to the required elevation shall be done in accordance with the applicable provisions of the Water System Standards. The existing standpipe shall be replaced with one having the correct length to bring the valve box to the required elevation. The existing standpipe may be reused if so approved by the Manager.

### 3.2 MANHOLES

- A. Upon completion, all manholes, including reconstructed or adjusted manholes, shall be thoroughly cleaned of all debris and the frames and covers painted with one coat of approved asphaltum paint.
- B. Manhole walls shall be constructed of concrete, brick, or hollow block with reinforcing as required in accordance with standard masonry practice. The sizes and dimensions shall be as shown on the Standard Details.
- C. A space of at least 2 inches shall be left between the wall and the upper half of the barrel of the pipe. This space shall be filled with asphalt or premolded asphaltic filler.
- D. If any portion of the manhole is below the 4-foot elevation, City and County Datum, or where water is encountered, that portion thereof shall be given a plaster coating of cement mortar 5/8-inch thick on the inside and outside. The plaster coating shall be composed of one part Portland cement and three parts of fine aggregate by volume. Hydrated lime may be used in the mortar but shall not exceed 10% by volume.
- E. Manhole top and bottom slabs shall be of concrete with reinforcing steel and shall be constructed in accordance with the dimensions and notes shown on the Standard Details.

END OF SECTION

## SECTION 02630

### COPPER PIPE AND FITTINGS

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and installing copper pipe and fittings. Unless otherwise noted in the plans, all copper pipe and fittings shall be in accordance with the State of Hawaii Water System Standards, dated 2002 as amended.

- A. Materials are usually specified in terms of the latest applicable standard specifications of the American Society of Testing Materials (ASTM), American National Standards Institute (ANSI) and American Water Works Association (AWWA). Should the standard specifications noted herein be in conflict with later revisions or amendments thereof, the Engineer shall be consulted for the applicable standard specifications.
- B. In addition the "Water System Standards," dated 2002 with certain modifications as hereinafter specified, are hereby incorporated into and made a part of these specifications by reference and shall be applicable to all work performed by the contractor under this section.
- C. In some instances, materials are specified as acceptable items by means of the manufacturer's catalog designations or reference numbers rather than by detailed specifications. It should be clearly understood that such references are frequently changed by the manufacturer. If any reference number is found to be obsolete, the Engineer should be consulted for the latest designation.

#### PART 2 - PRODUCTS

##### 2.1 MATERIALS

- A. Copper pipe shall be rigid copper type L for buried lines and type K for exposed lines. The nominal pipe sizes are shown on the plans.
- B. Fittings shall be corrosion-resistant wrought copper or cast bronze.
- C. Solder shall be 1/8-inch diameter and lead-free.
- D. Flux shall be non-corrosive and lead-free.
- E. Gate Valve shall be bronze, 200 psi maximum pressure rating, FPT inlet/outlet with non-rising stem.
- F. Hose Bibb shall be brass, 150 psi maximum pressure rating, 3/4" MPT inlet and garden hose thread outlet.

## PART 3 - EXECUTION

### 3.1 INSTALLATION AND WORKMANSHIP

All piping, fittings and appurtenances specified in this section shall be installed as shown on the plans and/or in accordance with the manufacturer's directions; "Water System Standards," dated 2002 or Uniform Plumbing Code," latest Edition; and "International Association of Plumbing and Mechanical Officials (IAPMO) Installation Standards," latest edition.

### 3.2 FINAL CLEANUP

All debris resulting from the work of this section shall be removed from the site.

END OF SECTION

## SECTION 02713

### WATER DISTRIBUTION SYSTEMS

#### PART 1 – GENERAL

##### 1.01 SUMMARY

Furnish labor, materials, services, equipment, and other necessary items required for accompanying the construction of the water systems. This shall include, but not be limited to the following: pipe and fittings for site water line including domestic water line, valves and fire hydrants, set lines, elevations, and grades for water distribution systems work and control system for duration of work including careful maintenance of benchmarks, property corners, monuments, or other reference points.

##### 1.02 GENERAL REQUIREMENTS

- A. Whenever the Contractor is required by State or local laws or regulations to make a deposit and/or to pay for a permit before proceeding with any work called for under this part of the Contract, the Contractor shall make the necessary deposit and/or pay for obtaining the required permit for the work.
- B. In addition, the following construction standards, with certain modifications as hereinafter specified, are hereby incorporated into and made a part of these specifications by reference and shall be applicable to all work performed by the Contractor under this section.
  - 1. Specific Sections of the County of Hawaii “Standard Specifications for Public Works Construction” dated September 1986 and “Standard Details for Public Works Construction” dated September 1984 as revised, except as amended on the drawings and/or in the specifications herewith. (Paragraphs concerning Measurements and Payments in the Sections are not applicable to this project.)
  - 2. County of Hawaii Department of Water Supply “Water System Standards”, Volume 1 dated 2002, “Approved Material List and Standard Details for Water System Construction”, Volume 2 dated 2002, "Water System External Corrosion Control Standards", Volume 3 dated 1991, and all subsequent amendments and additions, referred to hereinafter as the Water Standards.

##### 1.03 SUBMITTALS

- A. Label Construction Certification: The Contractor shall submit to the Engineer affidavits from the manufacturer’s of pipe, sections, fittings, valves, etc., furnished and installed under this section certifying that such materials delivered to the project conform to requirements of these specifications.

- B. As-Built Drawings: The contractor shall submit as-built drawings to the Engineer showing the actual location of the installed water system facilities.

1.04 COORDINATION

- A. Coordinate the work with termination of water system service connection outside building, connection to water system and trenching.

1.05 QUALITY ASSURANCE

- A. Perform work in accordance with utility company and/or municipality requirements.
- B. Valves: Manufacturer's name and pressure rating marked on valve body.

PART 2 – PRODUCTS

2.01 MATERIALS FOR WATER SYSTEM

Materials for water system shall be in accordance with the below listed sections of the City and County of Honolulu Board of Water Supply “Water System Standards Approved Materials List”, dated 2002, and the “Approved Material List, Standard Details for Water System Construction”, Volume 2 dated 2002, "Water System External Corrosion Control Standards", Volume 3 dated 1991, and all subsequent amendments and additions, except as amended in the plans and/or specifications herewith. (Paragraphs concerning Measurements and Payments in the Sections are not applicable to this project.)

- A. Ductile Iron Pipe, Class 52 Section 1
- B. PVC Class C-900 Pipe Section 1
- C. Valves and Appurtenances Section 2
- D. Hydrants and Appurtenances Section 4
- E. Cast Iron Manhole Covers, Frames, Rungs, Eyebolts, Meter Box Covers and Frames, And Standpipe Section 2
- F. Service Laterals and Appurtenances Section 3
- G. Warning and Identification Tape shall be blue plastic tape, acid and alkali resistant, approximately 6” wide, minimum 4 mil. thick, with warning and identification of service imprinted in bold black lettering continuously over the entire length of the

tape. Warning and identification to read “CAUTION, BURIED WATER LINE BURIED BELOW” or similar wording. The tape color and printing shall be permanent and unaffected by moisture.

## PART 3 – EXECUTION

### 3.01 INSTALLATION

#### A. Location and Adjustment of Existing Utility Lines:

1. The Contractor shall be responsible for precisely laying out the various exterior utility lines shown on the drawings. The locations shown on the drawings of the various existing utility lines, which the new lines are to cross over or under or connect to, were determined on the basis of the best information available; however, no assurance can be provided that the actual locations will be precisely as shown on the drawings.
2. In performing all work, the Contractor shall exercise due care and caution necessary to avoid any damage to and impairment in the use of any existing utility line. Any damage inflicted on existing lines resulting from the Contractor’s operations shall be immediately repaired and restored as directed by the Engineer at the Contractor’s expense.

#### B. Excavation and Backfill:

1. Trench excavation and backfill for the laying and installation of water lines, to the required line, grade, and structural excavation for the construction of appurtenant structures, shall be governed by Section 02225 (Trenching, Backfilling and Compacting).
2. Surplus material resulting from trench and structure excavation shall be used by the Contractor for backfilling, filling and grading to the extent required as specified elsewhere in these specifications.
  - a. Water Distribution System shall be in accordance with the City and County of Honolulu Board of Water Supply “Water System Standards”, dated 2002 as amended. The new lines shall be installed but not connected until pressure testing is completed. Connecting shall be done at the discretion of the Engineer. Pressure testing, flushing of valves and mains, and disinfection of the system shall be carried out in accordance with the County of Honolulu Board of Water Supply “Water System Standards”. The Contractor shall submit the results of such tests to the Engineer for approval. Any additional fittings of a temporary nature required for the purpose of working such tests shall be supplied and installed at the Contractor’s expense. All charges and

services by the Board of Water Supply shall be paid for by the Contractor.

3. Warning and identification tape shall be buried directly above the centerline of the pipe, approximately 12" below finished grade. Where the utility pipe is under pavements and slabs, the tape shall be buried approximately 6" below the top of the subbase.
4. Corrosion protection for ductile iron pipes and fittings shall comply with the County of Hawaii Department of Water Supply "Water System External Corrosion Control Standards", Volume 3, dated 1991.

### 3.02 CONCRETE FOR WATER SYSTEMS

Unless otherwise noted on plans, all concrete required for construction of manholes, valve boxes, etc., which are required for plumbing installations shall be DWS 2500.

### 3.03 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

Sterilize distribution system with chlorine before acceptance for domestic operation. Amount of chlorine shall be such as to provide dosage of not less than 50 parts/million. Thoroughly flush lines before introduction of chlorinating materials and after contact period of not less than 24 hours, system shall be flushed with clean water until residual chlorine content is not greater than 1.0 part/million. Open and close valves in lines being sterilized several times during contact period. After sterilization, take water and bacteriologically test in accordance with AWWA specifications. Do not place distribution system in service until approval is obtained from applicable governing authorities.

### 3.04 FIELD QUALITY CONTROL

- A. All pipework shall be tested at the pressure and leakage tests equal to the design working pressure of the pipe and maintain said pressure as shown on drawings.
- B. Furnish, install, and operate the necessary connections, pump, meter, and gauges. Leakage shall not exceed that permitted by AWWA Specifications C600-64 for mechanical joint and push-on joint pipe. Prior to running any field test, meter shall be tested, sealed, and approved by applicable governing authority at Contractor's expense.
- C. Locate and repair all leaks and repeat tests until test results are satisfactory and in compliance with this section.
- D. Furnish copy of results of meter test and hydrostatic pressure test to Owner upon completion of water distribution backfilling operations.

### 3.05 FINAL INSPECTION

At the time of final inspection of the work performed under the Contract, the utilities covered by this section shall be complete in every respect and operating as designed. All surplus materials of every character resulting from the work of this section shall have been removed. Any defects discovered in the utilities subsequent to this inspection shall be corrected prior to the final acceptance.

#### PART 4 – MEASUREMENT AND PAYMENT

Pay items for water distribution system shall be measured for payment by the units specified in the proposal.

Payment shall be made at the unit price bid per unit specified in the proposal or lump sum, and shall be full compensation for excavation, backfill, compaction, and furnishing materials, labor, equipment, and all other required incidentals.

END OF SECTION

## SECTION 03210

### REINFORCING STEEL

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

This section covers the requirements for furnishing and placing of deformed steel bars or welded wire fabric as reinforcement in concrete. The quality, type, size, and dimensions shall be as called for in these specifications and as shown on the plans.

#### PART 2 - PRODUCTS

##### 2.1 MATERIALS

- A. Bar reinforcement shall be of grade 40, billet steel deformed type bars made by the open hearth process and shall conform to the requirements of ASTM Designation A615.
- B. Welded wire mesh reinforcement shall be galvanized steel, electric welded type and shall conform to the requirements of ASTM Designation A185. The gauge of the wire and dimensions of the mesh shall be given in these specifications or as shown on the plans.

##### 2.2 EPOXY COATING

Epoxy coating of reinforcing steel shall be required for reinforcing steel to be used in the concrete pavement for the boat wash down area only. Epoxy coating for the reinforcing steel shall be applied by the electrostatic spray method conforming to ASTM A-775. Any defects, pin holes, or damage to epoxy coating shall be repaired with a touch coat of epoxy paint approved by the Engineer.

#### PART 3 - EXECUTION

##### 3.1 CONSTRUCTION

Unless otherwise specified, the installation of reinforcing steel shall conform to the requirements of "ACI Standard Building Code Requirements for Reinforced Concrete" and "Concrete Reinforcing Steel Institute."

- A. Protection of Material: Steel reinforcement shall be protected at all times from damage. When placed in the work, all reinforcing steel shall be new, free from dirt, detrimental scale, paint, oil, or other foreign substances. No material cleaned by sandblasting will be allowed. In the absence of manufacturer's quality mark, the Engineer may require standard ASTM tests be made on representative samples before acceptance. All costs incurred in connection with these tests shall be borne by the Contractor.

- B. Bending Diagrams and Order Lists: Two copies of all reinforcing steel order lists and bending diagrams shall be furnished directly to the Engineer and at the site for his use in administering the contract.

Furnishing such lists and diagrams to the Engineer shall not be construed to mean that the lists and diagrams will be reviewed for accuracy. The Contractor shall be wholly and completely responsible for the accuracy of the lists and diagrams and for furnishing and placing all bar reinforcing steel in accordance with the details shown on the plans as specified.

- C. Bending: Bends for stirrups and ties shall be made around a pin having a diameter not less than two times the minimum dimensions of the bar. Bends for other bars shall be made around a pin having a diameter not less than six times the minimum dimension of the bar, except that for bars larger than one inch, the pin shall be not less than eight times the bar thickness. All bars shall be bent cold before placing in forms.
- D. Placing: Reinforcement shall be accurately placed, supported, aligned, and secured against movement. Bars shall be tied at all intersections except where the spacing is less than one foot in each direction, in which case alternate intersections shall be tied.

Distance from forms and between layers of reinforcing shall be maintained by means of approved commercial chairs, stays, blocks, ties, hangers, or other approved supports. The use of pebbles, pieces of broken stone or brick, metal pipe, or wooden blocks shall not be permitted.

No concrete shall be placed prior to the inspection and approval of the size and placement of all reinforcement by the Engineer.

- E. Splicing: End laps of bars at splices shall be a minimum of 30 bar diameters and shall be staggered unless otherwise shown. Bars shall be installed in as long lengths as practicable and splices reduced to a minimum unless otherwise shown on the plans.
- F. Wire Mesh: Wire mesh shall be rolled out flat and firmly held in place to the lines and grade as shown on the plans before placing concrete. Splices shall be made by lapping not less than one mesh and securely tied.
- G. Coverage: Unless otherwise specified on the plans, the minimum clear thickness of concrete covering reinforcement shall be 3 inches.
- H. Inspection: All reinforcement shall be inspected and approved by the Engineer prior to the closing of forms. This approval, however, shall not be construed to relieve the Contractor of his responsibility to place all reinforcement in accordance with the plans. No concrete shall be poured until the required special inspections have been performed and all corrective actions have been made. Contractor shall submit a tentative schedule of concrete pours updated weekly, and notify the Engineer at least 2 working days prior to all concrete pours. If

insufficient notice is given or corrections are required, concrete pour shall be delayed to provide for the required inspections. No additional compensation or time extension will be allowed for delay caused by insufficient notice or corrective work.

END OF SECTION

Reinforcing Steel  
03210-3

## SECTION 03300

### CAST-IN-PLACE CONCRETE

#### PART 1 - GENERAL

##### 1.1 GENERAL REQUIREMENTS

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

##### 1.2 STORAGE OF MATERIALS:

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

##### 1.3 SUBMITTALS:

- A. **Manufacturer's Certificates of Compliance:** Submit certificates of compliance for all materials used in concrete work to include, but not limited to, Portland cement, aggregates, admixtures, curing compound, bonding agents, joint fillers, and joint sealants.
- B. **Concrete Mix Designs:** Submit proposed concrete mix designs for all classes of concrete to be used in the work. Mix designs shall be reviewed and accepted by the Engineer in writing prior to use in the work. No change in accepted concrete mix designs shall be made without the prior approval of the Engineer.
- C. **Test Results:** Submit test results for all testing specified herein. All testing shall be performed by an approved independent materials testing laboratory and cost of testing shall be borne by the Contractor.

##### 1.4 TESTS:

- A. **Slump:** Standard slump tests as described in ASTM C143 (Modification: Sampling of concrete for slump test shall be taken after at least 1/4 cubic yard of concrete has been discharged) shall be made periodically during the placement of concrete (not less than one slump test for every truck when ready mixed concrete is used). Any concrete batch tested and showing slumps exceeding the specified tolerance shall be rejected. Any concrete placed prior to slump testing shall be the sole responsibility of the Contractor and shall be rejected should the subsequent slump test of the batch in question indicate that the slump tolerance is being exceeded. All rejected concrete shall be promptly removed and properly replaced. All costs resulting therefrom shall be borne by the Contractor.
- B. **Compressive Strength:** Compressive strength testing of concrete shall be required in accordance with ASTM C39 for any concrete mix with specified minimum compressive strength at 28 days (f'c) of 3,000 psi or higher. A minimum of four 6-inch x 12-inch cylinder

test specimens shall be made from each concrete pour with additional sets taken at a rate of 4 cylinders for each additional 50 cubic yards. Notwithstanding this established rate, however, the Engineer may direct the Contractor to take additional concrete test specimens should there be an observed change in consistency or appearance of the concrete mix.

1. The Contractor shall make and identify all test specimens, and deliver to the approved independent materials testing laboratory.
2. The standard age for testing shall be one at 7 days and two at 28 days. The remaining test specimen shall be held in reserve and tested at 56 days or as directed should the results of the 28 day tests be deficient.
3. All test specimens shall be made and cured in accordance with ASTM C31.
4. The minimum strength requirements shall be considered satisfied if the average compressive strength of the two 28 day test specimens from each set equals or exceeds the specified minimum 28 day compressive strength and no individual strength test falls more than 500 psi below the specified strength.
5. In all cases where the strength of any pair of 28 day tests falls below the minimum compressive strength specified, the remaining test specimen shall be tested at 56 days or as directed by the Engineer. Should this test specimen attain the specified 28 day compressive strength, the batch will be considered to meet the strength requirements. However, if the results fall below the 28 day strength specified, the Engineer shall have the right to require that test specimens be cut from the structure. Specimens shall be selected by the Engineer from the location in the structure represented by the deficient test. Specimens shall be secured, prepared, and tested in accordance with ASTM C42 within a period of 60 days after placing the concrete. The testing shall be done by the approved independent testing laboratory. Concrete in the area represented by the core tests will be considered structurally adequate if the average strength of 3 cores is no less than 85 percent and the strength of a single core is no less than 75 percent of the 28-day strength specified. Should laboratory analysis indicate that the concrete does not meet the strength required all such concrete placed using the deficient mix shall be subject to rejection. The cost of cutting specimens from the structure, patching the resulting holes, and making the analysis, including laboratory and consultation costs, shall be borne by the Contractor. If the concrete is accepted, the holes from which the cored samples are taken shall be packed solid with no-slump concrete proportioned in accordance with the ACI 221 "Recommended Practice for Selecting Proportions of No-Slump Concrete." The patching concrete shall have an "extremely dry" consistency and the same design strength as the specified concrete.
6. If the strength of the specimens cut from the structure falls below the requirements stipulated above, the Engineer shall have the right to require any and all defective concrete be replaced, and all costs resulting therefrom shall be borne by the Contractor at no additional cost to the State.

## PART 2 - MATERIALS

## 2.1 MATERIALS:

A. Portland cement shall conform to the requirements of ASTM C150, Type I for all concrete.

B. Concrete Aggregates:

1. Fine aggregates shall be basalt or calcareous sands, or a combination thereof. They shall meet the grading requirements of ASTM C33 unless the concrete producer can provide past data that shows that a proposed non-conforming gradation will produce concrete with the required strength and suitable workability.

If manufactured sands are used in the concrete mix, the Contractor may select and use a water-reducing and/or an air-entraining admixture as specified hereinafter to provide satisfactory workability in the concrete. The cement content of a mix shall be as specified hereinafter, and the use of an admixture shall in no way result in the reduction of the cement factor.

2. Coarse Aggregates shall be crushed close-grained, blue lava rock (basalt) meeting the grading requirements of ASTM D448, size 57 or 67 except that the maximum size of aggregates shall not be larger than 1/5 of the narrowest dimension between sides of the forms of the member for which the concrete is to be used, nor larger than 3/4 of the minimum clear spacing between individual reinforcing bars or bundles of bars, nor one inch.

C. Water used in mixing concrete shall be fresh, clean and potable.

D. Water reducing or, water reducing and set retarding admixture shall conform to ASTM C494, Type A or D. High range water reducing admixture (HRWR) shall not be used without the approval of the Engineer. When permitted HRWR shall conform to ASTM C494, Type F or G. Air entraining admixture shall conform to ASTM C260. Corrosion inhibitor shall be DCI-S manufactured by W.R. Grace or approved equal. All admixtures shall be mixed in proper amount in accordance with directions of the manufacturer. Admixtures containing chlorides shall not be used.

E. Premolded Expansion Joint Filler: Premolded material conforming to ASTM D1751 or ASTM D994 shall be installed at expansion joints and at locations shown on the plans. Premolded joint filler shall be 3/8" thick unless otherwise indicated.

F. Joint sealing compound for horizontal applications shall be self-leveling traffic grade sealant conforming to ASTM D1190 and be compatible with the premolded expansion joint filler. Joint sealing compounds for other purposes shall be silicone rubber based with viscosity required for proper placement; non-sag for vertical or overhead applications.

G. Curing compound shall conform to ASTM C309 Type 1, and be applied in accordance with manufacturer's instructions and recommendations. The curing compound shall be compatible with the finish materials to be received.

- H. Form release agent shall be of a type compatible with the finishes to be applied, or shall be completely removed from the concrete surfaces prior to application of the required finish materials.
- I. Corrosion inhibitor admixture: Shall be included in the concrete mix for the boat wash down area and boat launch ramp concrete pavement. Corrosion inhibitor shall be calcium nitrite based, BASF Rheocrete CNI or approved equal. Migrating corrosion inhibitors are not acceptable.

PART 3 - EXECUTION

3.1 DESIGN OF CONCRETE MIXES:

- A. Ingredients for concrete shall be Portland cement, fine and coarse aggregates, admixtures and water.
- B. Only concrete with normal weight aggregates shall be used.
- C. Concrete shall be designed so that the concrete materials will not segregate nor cause excessive bleeding. Slump shall be between 3 to 5 inches. If high range water reducing admixture (HRWR) is permitted, slump taken prior to addition of such admixture shall meet the above requirements. Slump after the addition of HRWR shall be between 6" to 8".
- D. Concrete shall meet the following minimum requirements:

Maximum Water-Cement Ratio (lb./lb.)	Min. 28 Day Compressive Strength (psi)	Typical Locations Where Mix Is To Be Used
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0.50	3,500	All new concrete.
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- E. A water-reducing and/or water reducing and set retarding admixture, corrosion inhibitor, and, if required, an air-entraining admixture to provide satisfactory workability of the concrete shall be added to the concrete mix at the batch plant. High range water reducing admixture, if permitted, shall be added to the mixer at the jobsite. The use of admixtures shall in no way result in the reduction of the amount of Portland cement used.
- F. Corrosion inhibitor shall be introduced at a rate of 3 gallons per cubic yard of concrete.

3.2 JOINTS:

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

for bond.

- B. Except for slabs-on-grade and pavements, all reinforcing steel shall be continuous across construction joints. Keyways and dowels shall be provided as detailed or directed. Continuous longitudinal keyways at least 1-1/2" deep shall be provided in all joints in walls and between walls and slabs or footings.
- C. Expansion joints shall be provided as detailed at locations indicated on the plans. Reinforcement or other embedded metal items bonded to the concrete shall not be permitted to extend continuously through any expansion joint.

### 3.3 MIXING CONCRETE:

- A. Ready mixed concrete shall be supplied by an approved batching plant and delivered in concrete mixer trucks to insure uniformity and homogeneity of the concrete mix. Contractor shall coordinate delivery to provide a sufficient quantity of concrete to continuously carry on the work and deposit concrete within the allowable time limits for each batch.
- B. Batches of 2 cubic yards or less may be mixed at the jobsite. Should the contractor elect to use jobsite mixing it shall be done in accordance within ACI 614 and as follows:
  - 1. All ingredients shall be accurately measured to ensure proper mix proportions prior to addition in the mixer. Concrete shall be thoroughly mixed in a batch mixer of an approved type and size which will insure a uniform distribution of materials throughout the mass. The machine shall have a control device to prevent materials from being discharged until they have been mixed for the specified minimum time.
  - 2. The entire contents of the drum shall be discharged before materials of the succeeding batch are placed therein. No mixer shall be used which has a rated capacity of less than one sack batch and no mixer shall be charged in excess of its rated capacity. In addition, mixer shall be of sufficient size to maintain a continuous concrete pour.
  - 3. The first batch of materials placed in the mixer after the machine has been cleaned shall contain a sufficient excess of cement, sand and water to coat the inside of the drum without reducing the required mortar content of the mix. Upon cessation of mixing, the mixer shall be thoroughly cleaned.
- C. Ready Mixed and Mixed-In-Transit Concrete shall be mixed to conform to the provisions of ASTM C94 and as follows:
  - 1. The plant shall have sufficient capacity and transportation equipment to deliver concrete at the rate desired. The interval between batches for a pour shall not exceed 30 minutes.
  - 2. The time elapsed between the introduction of the mixing water to the cement and aggregates or the cement to the aggregates, and the placing of concrete in its final position shall not exceed 90 minutes.
  - 3. In hot weather (more than 90 degrees F) or under conditions contributing to quick

stiffening of the concrete, the elapsed time in Paragraph C.2. above, shall not exceed 60 minutes if no retarding admixture is used. If an ASTM C494, Type B or D admixture is added to the concrete, the maximum elapsed time shall remain at 90 minutes.

- D. Concrete shall be mixed only in such quantity as is required for immediate use. No retempering will be permitted and concrete that has started to harden shall be discarded and promptly removed from the job.
- E. Admixtures conforming to Paragraph 2.1 shall be used in the concrete as recommended by the supplier and accepted by the Engineer.
- F. Hand mixing of concrete will not be permitted except to make up shortages for fence and minor sign post footings, thrust block, utility jackets, and other non-structural purposes.

#### 3.4 PLACING CONCRETE:

- A. No concrete shall be placed in the absence of the Engineer or his representative who shall be given at least two working days advance notice of starting time of concrete pour. Place no concrete until foundation, forms, reinforcing steel, pipes, conduits, sleeves, hangers, anchors, inserts, waterproofing, ground treatment and other work required to be built into or placed ahead of concrete placing have been inspected and approved by the Engineer or his representative. Concrete placed without such notice and approval shall be rejected, removed and replaced at the expense of the Contractor.
- B. Preparation:
  - 1. All sawdust, chips and other construction debris and extraneous matter shall be removed from interior of forms. Struts, stays, bracing, or blocking serving temporarily to hold forms in correct shape or alignment shall be removed when the concrete placing has reached an elevation rendering their services unnecessary.
  - 2. Concrete shall be placed upon clean, damp surfaces with no free water, or upon properly compacted fills but never upon soft mud or dry, porous earth. Before pouring footings or foundations, bottoms of excavations shall be properly leveled off and tamped.
  - 3. Before depositing new concrete on or against concrete which has set, all accumulations of mortar splashed upon reinforcing steel and the surfaces of forms shall be removed and the forms shall be retightened. The surfaces of previously set concrete shall be thoroughly roughened and cleaned of all foreign matter and laitance, saturated with water and slushed with a coat of cement grout. New concrete shall be placed before the grout has attained its initial set.
- C. Conveying:
  - 1. Concrete shall be conveyed from mixer to forms as rapidly as practicable by methods that will prevent segregation.
  - 2. Concrete shall be deposited as nearly as practicable in its final position. Extensive spading as a means of transportation shall be avoided and in no case shall vibrators be

used to transport concrete inside the forms.

3. Open troughs and chutes shall have a slope not to exceed one vertical to 2 horizontal and not less than one vertical and 3 horizontal. Chutes more than 20 feet long and chutes not meeting the slope requirements may be used provided they discharge into a hopper before distribution.
4. The concrete shall not be allowed to drop freely more than 6 feet except where authorized by the Engineer. When placing operations would involve the dropping of concrete from a height of more than 6 feet, it shall be conveyed through pipes or flexible drop chutes.
5. If any appreciable segregation occurs through the conveying methods employed, their use shall be discontinued and some other satisfactory method of placing concrete shall be used.
6. All chutes, troughs, pipes and other means of conveyances shall be kept clean from coatings of hardened cement or concrete by thoroughly cleaning with water and chipping after each pour. Water used for flushing shall be discharged away from the vicinity of the concrete or forms already in place.
7. Placement of concrete below water shall be avoided wherever possible. Schedule concrete pours with consideration of tides. When it cannot be avoided, concrete placed below water shall be placed by means of a tremie. Tremie concrete shall be deposited within one foot of the bottom of excavation and level maintained until the top surface of the concrete is at least five feet above the tremie outlet. The tremie pipe shall be withdrawn at the same rate as the concrete pour to maintain a height difference of at least five feet, and concrete consolidated to eliminate any pockets or voids. The pour shall be stopped when the concrete reaches the required level. Any concrete that has become contaminated by sea water shall be removed and properly disposed.

D. Depositing:

1. Unless adequate protection is provided, concrete shall not be placed during rain. Rainwater shall not be allowed to increase the mixing water nor to damage the surface finish. Fresh concrete that has been deposited but has not attained its initial set shall be protected in the event of rain.
2. Concrete shall be placed so as to avoid segregation of the materials and the displacement of the reinforcing. As nearly as practicable, the concrete shall be dropped vertically without hitting reinforcement, sleeves or forms into its final position in order to avoid segregation of coarse aggregates from concrete. After the initial set of concrete, the forms shall not be jarred and no strain shall be placed on the projecting reinforcing.
3. Except for vertical members, formed concrete shall be deposited in horizontal layers no deeper than 2 feet avoiding inclined layers and inclined construction joints. The depth of layers shall be shallow enough so that the succeeding layer will be placed before the previous layer has attained its initial set. Concrete shall not be allowed nor shall it be

caused to flow horizontally or on slopes in the form. Concrete placing on a slope shall begin at the lower end of the slope and progress upward.

4. Construction joints shall be made only where located on the plans or approved by the Engineer. Pours shall be planned to provide for the continuous placing of concrete from one construction joint to another. The face edges of all joints that are exposed to view shall be carefully finished true to line and elevation.
5. In slab construction, placing of the concrete shall be started at the far end of the work so that each batch will be dumped against previously placed concrete, not away from it. The concrete shall not be dumped in separate piles and the piles then leveled and worked together. For floor slabs on earth, additional requirements in Paragraph 3.5 shall apply.
6. If depositing of concrete must be stopped short of a full placement, it shall be leveled to a horizontal plane or stopped against a vertical bulkhead. Such bulkhead or horizontal plane shall be located only as acceptable to the Engineer.

E. Compaction:

1. All concrete shall be consolidated by vibration so that the concrete is thoroughly worked around the reinforcement, around embedded items, and into corners of forms, eliminating all air pockets which may cause honeycombing, pitting, or planes of weakness. All compaction shall be done by use of high frequency internal vibrators. Where the vibrator cannot be inserted into the concrete, compaction shall be done by spading, rodding or forking.
2. Frequency of vibrator shall be not less than 7,000 impulses per minute. The Contractor shall provide a sufficient number of vibrators to properly consolidate all concrete immediately after placing. At least one standby vibrator shall be on hand at all times during placement of the concrete.
3. Vibration shall not be applied through contact with reinforcement or forms. Vibration shall penetrate previously deposited concrete sufficiently to prevent pockets or voids or construction joints from occurring between lifts, but must not be applied to concrete which has set up sufficiently to cease to be plastic under vibration.

F. Finishing:

1. Top surfaces of concrete slabs and walkways shall receive a heavy broom finish or other approved non-slip finish and edged to provide rounded exposed corners. Radius of rounded edges shall be ¼" unless otherwise indicated. Sidewalks shall be scored at equal spaces at approximate 4' intervals perpendicular to traffic.
2. Surface defects at formed surfaces shall be patched or repaired as specified in Paragraph 3.6. Fins shall be removed, corners and edges ground flush, and rubbed or cement-wash finish applied to a uniform color and smooth texture. Such finishing shall be accomplished in the dry when the tide allows.
3. Top surfaces of pile caps shall be float finished and crowned for drainage. Areas to

receive bearing plates shall be level and troweled smooth.

### 3.5 SLABS-ON-GRADE, STEPS AND LANDINGS:

- A. Concrete surfaces to receive foot traffic shall be placed over prepared, well compacted subgrade and reinforced as shown on the plans. Compacted aggregate base course or well tamped #3B fine gravel shall be provided if called for on the drawings.
- B. Care shall be taken in handling and placing the reinforcement as follows:
  - 1. Reinforcing steel shall not be rolled over by trucks, buggies, or wheelbarrows, nor trampled to the extent that it is bent out of plane. Material which has been so bent that it cannot be laid out flat shall be rejected.
  - 2. Reinforcing steel and dowels shall be positively set, either prior to or during the placement of concrete, to the level(s) required as indicated on the drawings or as specified herein.
- C. Finish and scored joints shall be provided as specified above.
- D. A premolded expansion joint filler shall be provided where slabs abut vertical surfaces (concrete or masonry walls) and as indicated on the drawings. Width of filler strips shall equal depth of slab. Thickness shall be 3/8" unless otherwise indicated.
- E. Expansion joints shall be sealed with traffic grade joint sealant with depth two thirds of the joint width, but not less than 3/8" deep.

### 3.6 REPAIR OF DEFECTS

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

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

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

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

4. An epoxy-and-sand mixture may be used in lieu of the mortar-and-bonding agent mixture for any of the patching above. The preparation of the surface to receive the patch, as well as the mixture proportions of the epoxy and sand, shall be in strict conformance with the manufacturer's instructions.

- D. Except for concrete required to be removed under paragraph 3.6 A, any concrete which is not constructed as shown on the plans or is out of alignment and/or level beyond allowable tolerances may be patched using an epoxy-and-sand mixture.

The proportions of the mix and the preparation of the surface to receive the patch shall be in strict conformance with the manufacturer's instructions except as otherwise specified herein. The minimum thickness of the patch shall be 1/4". No "feathering" to a lesser thickness will be permitted.

Misalignment which requires correction more than 1 inch thickness shall be repaired in the following manner:

1. The surface of the affected area shall be chipped, etched, or otherwise cleaned and roughened to provide a sound surface for bonding;
2. Concrete nails or other fasteners which can provide positive mechanical bonding of the patch shall be set into the surface at about 18 inches o.c. in all directions with a minimum of 2 rows;
3. Reinforcement as approved by the Engineer shall be installed in those portions of the patch which exceed 2 inch thickness;
4. A bonding agent suitable for use in the repair location (epoxy required for exterior use) shall be applied over the entire surface to be patched;
5. Formwork to the true lines called for shall be installed over the area requiring the patch; and

6. Concrete or grout with aggregate sized appropriately for the cavity and which will provide strength equivalent to that of the base surface shall be placed in the form, properly compacted, finished, and suitably cured.
- E. Shrinkage and temperature cracks in exposed concrete except slabs on grade shall be patched by veeing out the crack to a minimum width and depth of 1/4" and filling solid with epoxy mortar. Whenever necessary, the Engineer may require cracks be repaired and patched by epoxy injection and require the Contractor to submit methods of repair for approval before the commencement of the repair work.

### 3.7 CURING AND PROTECTION:

- A. All concrete shall be initially cured for a period of not less than 7 days by one of the methods listed below. During this curing period, the concrete shall be maintained with minimal moisture loss at a relatively constant temperature. Fresh concrete shall be protected from heavy rains, flowing water, mechanical injury, and injurious action of the sun. Curing method selected must be compatible with the finish to be applied to the concrete. Curing shall immediately follow the finishing operation.
- B. Water Curing: If cured with water, concrete shall be kept wet by mechanical sprinklers, by ponding, or by any other method which will keep the surfaces continuously wet.
- C. Saturated Sand Curing: Surfaces cured with sand shall be covered with a minimum of 1-inch thickness of sand which shall be kept uniformly distributed and continuously saturated during the entire curing period.
- D. Curing Compounds: Curing compounds shall not be used on concrete surfaces that are to receive paint finish, acid stain, resilient flooring, or other finishes except those that are recommended by the manufacturer to be compatible with the applied finish. Application shall be in accordance with the manufacturer's recommendations. If curing, sealing or other compounds are used which are incompatible with applied finish, such compound shall be thoroughly removed by grinding with a terrazzo grinder prior to applying the finish materials.
- E. Waterproofing Paper: Waterproof paper or opaque polyethylene film conforming to ASTM C171 may be used. The paper or film shall be anchored securely and all edges sealed or applied in such a manner as to prevent moisture escaping from the concrete. Waterproof paper shall not be used on concrete that will be exposed in the completed work.

### 3.8 CLEANING:

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

END OF SECTION