

DIVISION OF STATE PARKS

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

BOARD OF LAND AND NATURAL RESOURCES

Suzanne D. Case
Chairperson

CONTRACT SPECIFICATIONS AND PLANS

Job No. J45CO49B
DIAMOND HEAD STATE MONUMENT
ROCKFALL MITIGATION – PHASE 2 (FY2015)
HONOLULU, OAHU, HAWAII

Civil Engineer: AECOM Technical Services, Inc.

May 2016

State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION
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Job No. J45CO49B
DIAMOND HEAD STATE MONUMENT
ROCKFALL MITIGATION – PHASE 2 (FY2015)
HONOLULU, OAHU, HAWAII

Approved: _____



CURT A. COTTRELL
Administrator
Division of State Parks

Approved: _____



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

May 2016

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PLANS (Bound Separately)

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

NOTICE TO BIDDERS
(Chapter 103D, HRS)

COMPETITIVE BIDS for Job No. J45CO49B, Diamond Head State Monument Rockfall Mitigation – Phase 2 (FY2015), Honolulu, Oahu, Hawaii shall be submitted to the Department of Land and Natural Resources, Engineering Division on the specified date and time through the Hawaii State e-Procurement (HiePRO). HiePRO is accessible through the State Procurement Office website at www.spo.hawaii.gov.

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

The project is located at Diamond Head, Honolulu, Oahu, Hawaii.

The work shall generally consist of rock scaling and removal, installing grouted anchors, and installing structural and sculpted shotcrete.

Due to the nature of work contemplated, bidders must possess a valid State Contractor's license, classification C68RL.

A mandatory pre-bid conference and site visit will be held at the Diamond Head Monument Interpretive Kiosk, located at Diamond Head Road, Honolulu, on May 12, 2016 at 9:00 am.

The estimated cost of construction is \$1,080,000.

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

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

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

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

INFORMATION AND INSTRUCTIONS TO BIDDERS

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INFORMATION AND INSTRUCTIONS TO BIDDERS

- A. PROJECT LOCATION AND SCOPE OF WORK: The project location and scope of work shall be as generally described in the Notice to Bidders.
- B. PROPOSALS: Bidders shall submit their bid, including the completed proposal form, bid bond, and any other documents required by the solicitation as part of their bid through the State of Hawaii e-Procurement System (HIePRO). See Item D, PROPOSAL FORM.
- C. GENERAL CONDITIONS: The Department of Land and Natural Resources Interim General Conditions dated October 1994, as amended, shall be made a part of these contract specifications and are referred to hereafter as the General Conditions.
- D. PROPOSAL FORM: **The Bidders shall fill out and upload the electronic copy of the proposal form to the HIePRO website when submitting the bid. Bid Proposals shall not be mailed, faxed or delivered to the State, unless requested to do so after the designated closing date. The successful Bidder shall fill out and print a hard copy of the proposal form, sign and submit the form with the contract award package.**
- E. OMISSIONS OR ERASURES: Any proposal which contains any omission or erasure or alteration not properly initialed, or conditional bid, or other irregularity may be rejected by the Board of Land and Natural Resources (Board).
- F. NOTICE OF INTENT TO BID AND QUESTIONNAIRE:
A Notice of Intent to Bid is not required for this project. In compliance with HRS Section 103D-310, the lowest responsive and responsible bidder may be required to complete a questionnaire. When requested by the State, the completed questionnaire shall be submitted to the Chief Engineer for evaluation. Failure to furnish the requested information within the time allowed may be grounds for a determination of non-responsibility, in accordance with HRS Section 103D-310 and HAR Section 3-122-108.
- G. BID SECURITY: A bid security will be furnished by each bidder as provided in sub-section 2.7 of the General Conditions. The successful bidder's bid security will be retained until Contract execution and furnished a performance and payment bond in an amount equal to one hundred percent (100%) of the total Contract price, including an amount estimated to be required for extra work, is furnished.
- The Board reserves the right to hold the bid securities of the four lowest bidders until the successful bidder has entered into a contract and has furnished the required performance bond. All bid securities will be returned in accordance with sub-section 3.5 of the General Conditions.
- Should the successful bidder fail to enter into a contract and furnish a satisfactory performance bond within the time stated in the proposal, the bid security shall be forfeited as required by law.
- H. CONTRACTOR'S LICENSE REQUIRED: The Board will reject all bids received from contractors who have not been licensed by the State Contractors License Board in accordance

with Chapter 444, HRS; Title 16, Chapter 77, Hawaii Administrative Rules; and statutes amendatory thereto.

- I. IRREGULAR BIDS: No irregular bids or propositions for doing the work will be considered by the Board.
- J. WITHDRAWAL OF BIDS: No bidder may withdraw his bid between the time of the opening thereof and the award of contract.
- K. SUCCESSFUL BIDDER TO FILE PERFORMANCE AND PAYMENT BONDS: The successful bidder will be required to file performance and payment bonds each; in the amount equal to the total contract price, including amounts estimated to be required for extra work, as provided in sub-section 3.6 of the General Conditions.
- L. NUMBER OF EXECUTED ORIGINAL COUNTERPARTS OF CONTRACT DOCUMENTS: If requested by the Board, six copies of the Contract, performance and payment bonds shall be executed.
- M. CHANGE ORDERS: No work of any kind in connection with the work covered by the plans and specifications shall be considered as change order work, or entitle the Contractor to extra compensation, except when the work has been ordered in writing by the Chief Engineer (Engineer) and in accordance with sub-section 4.2 of the General Conditions.

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

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

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

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

- O. PERMITS: The State will process permit applications whenever possible, and the Contractor shall procure the pre-processed permits and pay the required fees. If permit applications are not processed by the State, the Contractor shall process the permit applications, permits and

licenses, and pay all charges and fees. In all cases, the Contractor shall give all notices necessary and incident to the due and lawful prosecution of the work.

- P. PROPERTY DAMAGE: It shall be the responsibility of the contractor to respect State property and to prevent damage to existing improvements. The Contractor will be responsible for damages resulting from construction operations. Immediately upon discovery, the Contractor shall repair such damage to the satisfaction of the Engineer.

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

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

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

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

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

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

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

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

- T. HIRING OF HAWAII RESIDENTS: The Contractor shall comply with Act 68, SLH 2010, in the performance and for the duration of this contract. The Contractor shall ensure that Hawaii residents compose not less than eighty percent of the workforce employed to perform the contract work on the project. The eighty percent requirement shall be determined by

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

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

- U. WATER AND ELECTRICITY: The Contractor shall make all necessary arrangements and pay all expenses for water and electricity used in the construction of this project.
- V. PUBLIC CONVENIENCE AND SAFETY: The Contractor shall conduct construction operations with due regard to the convenience and safety of the public at all times. No materials or equipment shall be stored where it will interfere with the safe passage of public traffic. The Contractor shall provide, install, and maintain in satisfactory condition, all necessary signs, flares and other protective facilities and shall take all necessary precautions for the protection of the work and the convenience and safety of the public. The Engineer shall have the right to suspend the performance of the work in accordance with sub-section 7.20 - Suspension of Work of the General Conditions.
- W. WORK TO BE DONE WITHOUT DIRECT PAYMENT: Whenever the contract that the Contractor is to perform work or furnish materials of any kind for which no price is fixed in the contract, it shall be understood that the Contractor shall perform such work or furnish said materials without extra charge or allowance or direct payment of any sort. The cost of performing such work or furnishing said material is to be included by the Contractor in a unit price for the appropriate item unless it is expressly specified that such work or material is to be paid for as extra work.
- X. AS-BUILT DRAWINGS: As-built drawings, the intent of which is to record the actual in-place construction so that any future renovations or tie-ins can be anticipated accurately, shall be required. All authorizations given by the Engineer to deviate from the plans shall be drawn on the job site plans. All deviations from alignments, elevations and dimensions which are stipulated on the plans shall be recorded on the as-built drawings. Final as-built drawings shall be submitted to the Engineer for review and approval. After the Engineer approves the as-built drawings, the contractor shall submit an electronic copy in Adobe PDF format on CD ROM.
- Y. ASBESTOS CONTAINING MATERIALS: The use of asbestos containing materials or equipment is prohibited. The Contractor shall insure that all materials and equipment incorporated in the project are asbestos-free
- Z. WORKER SAFETY: The Contractor shall provide, install and maintain in satisfactory condition all necessary protective facilities and shall take all necessary precautions for the protection and safety of its workers in accordance with the Occupational Safety and Health Standards for the State of Hawaii. The Engineer shall have the right to suspend the performance of the work in accordance with sub-section 7.20 - Suspension of Work of the

General Conditions.

- AA. TOILET FACILITIES: All toilet facilities constructed at the project site shall be in accordance with the Public Health Regulations of the State Department of Health (DOH). All necessary precautions shall be observed at the project site. The use of sanitary facilities shall be strictly enforced and workers violating these provisions shall be promptly discharged.
- BB. SIGNS: Whenever the project involves closing or obstructing any public thoroughfare, the Contractor shall provide traffic signs conforming to the applicable provisions of the current edition of the "Manual on Uniform Traffic Control Devices for Streets and Highways", published by the Federal Highway Administration as directed by the Engineer for the purpose of diverting or warning traffic prior to the construction area. All traffic signs shall bear proper wording stating thereon the necessary information as to diverting or warning traffic.

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

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

- CC. FIELD OFFICE AREA FOR DEPARTMENT: When indicated in the Proposal, the Contractor shall provide a housed working area of at least 100 square feet adjacent to the Contractor's office for the Department's use. This area will be used by the Engineer to perform tests and to store equipment. As a minimum, the field office shall include the following: standard sized office desk and chair, lighting, ventilation, window-type air conditioning rated at 5,000 BTU, door and window with locking hardware, electrical outlets, and working communications facilities (a cellular telephone is acceptable). The Department will pay for all long distance toll charges made by the Engineer.
- DD. QUANTITIES: All bids will be compared on the basis of quantities of work to be done as shown in the Proposal; the quantities shown in the Unit Price items are estimated, being given as a basis for comparison of bids. The Board reserves the right to increase or decrease the quantities given under the items or delete items entirely as may be required during the progress of the work.
- EE. OTHER HEALTH MEASURES: Forms of work site exposure or conditions which may be detrimental to the health or welfare of workers or of the general public shall be eliminated or reduced to safe levels as required by the DOH codes, standards, and regulations. Suitable first aid kits and a person qualified to render first aid, as specified in the DOH regulations, shall be provided at all times when work is scheduled.
- FF. HAWAII BUSINESS OR COMPLIANT NON-HAWAII BUSINESS REQUIREMENT: Bidders (Contractors) shall be incorporated or organized under the laws of the State or be registered to do business in the State as a separate branch or division that is capable of fully performing under the contract, as stipulated in §3-122-112 HAR.

GG. COMPLIANCE WITH §3-122-112 HAR:

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

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

Alternately, instead of separately applying for these certificates at the various state agencies, bidder may choose to use the Hawaii Compliance Express (HCE), which allows businesses to register online through a simple wizard interface at <http://vendors.ehawaii.gov> to acquire a “Certificate of Vendor Compliance” indicating the bidder’s status is compliant with the requirements of §103D-310(c), HRS, and shall be accepted for contracting and final payment purposes. Bidders that elect to use the new HCE services will be required to pay an annual fee of \$12.00 to the Hawaii Information Consortium, LLC (HIC). Bidders choosing not to participate in the HCE program will be required to provide the paper certificates as instructed in the previous paragraphs.

P R O P O S A L

FOR

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION
State of Hawaii

JOB NO. J45CO49B
DIAMOND HEAD STATE MONUMENT
ROCKFALL MITIGATION – PHASE 2 (FY2015)
HONOLULU, OAHU, HAWAII

_____, 2016

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

Dear Sir:

The undersigned, having carefully examined the local conditions and all available records and information covering conditions which may affect the cost of the work to be performed, and having carefully examined the Plans and Specifications, and other contract documents, hereby proposes to furnish and pay for all materials, tools, equipment, labor and other incidental work necessary to perform the work of rock scaling and removal, traffic control, installing grouted anchors and rock dowels, and installing structural and sculpted shotcrete, as required or called for in this Proposal, all according to the true intent and meaning of the Notice to Bidders, Information and Instructions to Bidders, Proposal, Detailed Specifications, Interim General Conditions, Plans, and any and all addenda for:

JOB NO. J45CO49B
DIAMOND HEAD STATE MONUMENT
ROCKFALL MITIGATION – PHASE 2 (FY2015)
HONOLULU, OAHU, HAWAII

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

_____ Dollars (\$_____)
and will fully complete all work under this contract within 60 consecutive calendar days from the date of written notice to proceed, including date of said order, said total sum being itemized on the following pages.

PROPOSAL

Item No.	Quantity	Unit	Description	Unit Price	Total
Diamond Head Summit Trail					
1.	150	CY	Shotcrete, including anchors, reinforcement, drain strips, sculpted finish and other incidentals, installed complete.	\$ _____	\$ _____
2.	1	LS	Rock Slope Scaling for removal of loose rocks at sites identified on the plans, inclusive of vegetation clearing and tree removal and all labor, debris removal and proper disposal of materials, complete.	LS	\$ _____
3.	10	Crew-Days	Additional Rock Slope Scaling for removal of loose rocks found in the field, but not identified on the plans, inclusive of vegetation clearing and all labor, debris removal and proper disposal of materials, complete.	\$ _____	\$ _____
4.	40	CY	Additional Sculpted Shotcrete for locations found in the field, but not identified in the plans, inclusive of all labor, materials, and equipment for installation per Plans Sheet C-7 and as directed by the Engineer, complete.	\$ _____	\$ _____
5.	40	LF	Rock Dowels at locations identified on the plans, inclusive of all labor and materials, complete.	\$ _____	\$ _____
Diamond Head Road					
6.	1	LS	Rock Slope Scaling for removal of loose rocks at sites identified on the plans, inclusive of vegetation clearing and all labor, debris removal and proper disposal of materials, complete.	LS	\$ _____
7.	1	LS	Traffic Control	LS	\$ _____
8.	1	Allow	Landscaping	\$5,000	\$5,000
Subtotal Base Bid (Items 1-8)					\$ _____

9.	1	LS	Mobilization and Demobilization. (Not to Exceed 10% of the Total Sum Bid)	LS	\$_____
Total Sum Base Bid (Items 1-9)					\$_____

HAWAII PRODUCTS PREFERENCE AND/OR USE OF HAWAII PRODUCTS

In accordance with Act 175, SLH 2009, the Hawaii products preference is applicable to this solicitation. Hawaii products may be available for items noted on the Offer Form. The Hawaii Products List is available on the SPO webpage at <http://spo.hawaii.gov/for-vendors/hawaii-product-preferences/>.

Bidder offering a Hawaii product (“HP”) shall identify the HP in the table below. Any person desiring a Hawaii product preference shall have the product(s) certified and qualified, if not currently on the Hawaii Products List, prior to the deadline for receipt of offer(s) specified in the procurement notice and solicitation. The responsibility for certification and qualification shall rest upon the person requesting the preference.

Persons desiring to qualify their product(s) not currently on the Hawaii Product List, shall complete Form SPO-38, *Certification for Hawaii Product Preference*, and submit the completed form to the Procurement Officer providing any additional information required by the Procurement Officer. One form shall be completed and submitted for each product. Form SPO-38 is available on the SPO webpage at <http://spo.hawaii.gov/all-forms/>.

For the purpose of selecting the low bid when a solicitation contains both HP and non-HP, the price offered for a HP item shall be decreased by subtracting 10% for the class I or 15% for the class II HP item(s) offered. The lowest total offer, taking the preference into consideration, shall be awarded the contract, unless the offer provides for additional award criteria. The contract amount of any contract awarded, however, shall be the amount of the price offered, exclusive of the preferences.

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

Item No.	Pre-Approved Hawaii Product Description & Manufacturer	Class (I or II)	Quantity	Unit Measure	Unit Price	Total Price

RECYCLED PRODUCTS PREFERENCE

This project allows a 10% price preference for recycled products in accordance with HRS 103D-1005. Bidders are required to complete this section. FAILURE TO COMPLETE THIS SECTION MAY BE SUFFICIENT CAUSE FOR REJECTION OF THE BID.

Only the following products are being considered for the recycled product preference. Please indicate your selection of recycled or non-recycled product by indicating its cost FOB jobsite unloaded in the schedule below, including applicable General Excise & Use Taxes.

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

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

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

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

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

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

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

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

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

APPRENTICESHIP AGREEMENT PREFERENCE

1. If applicable to this project, any bidder seeking the preference must be a party to an apprenticeship agreement registered with the State Department of Labor and Industrial Relations (DLIR) at the time the bid is submitted for each apprenticeable trade the bidder will employ to construct the project. “Employ” means the employment of a person in an employer-employee relationship.
 - a. The apprenticeship agreement shall be registered with the DLIR and conform to the requirements of Hawaii Revised Statutes Chapter 372.
 - b. Subcontractors do not have to be a party to an apprenticeship agreement for the bidder to obtain preference.
 - c. The bidder is not required to have apprentices in its employ at the time the bid is submitted to qualify for the preference.
2. A bidder seeking the preference must state the apprenticeable trade the bidder will employ for each trade to be employed to perform the work by submitting a completed signed original Certification Form 1 verifying participation in an apprenticeship program registered with DLIR. “Apprenticeable trade” shall have the same meaning as “apprenticeable occupation” pursuant to Hawaii Administrative Rules (HAR) §12-30-5.
 - a. The *Certification Form 1* shall be authorized by an apprenticeship sponsor listed on the DLIR list of registered apprenticeship programs. “Sponsor” means an operator of an apprenticeship program and in whose name the program is approved and registered with the DLIR pursuant to HAR §12-30-1.
 - b. The authorization shall be an original signature by an authorized official of the apprenticeship sponsor.
 - c. The completed signed original Certification Form 1 for each trade must be submitted with the bid. Previous certifications shall not apply.
 - d. When filling out the Certification Form 1, the name of Apprenticeable Trade and Apprenticeship Sponsor must be the same as recorded in the List of Construction Trades in Registered Apprenticeship Programs that is posted on the DLIR website. “Registered apprenticeship program” means a construction trade program approved by the DLIR pursuant to HAR §12-301 and §12-30-4.
 - e. The *Certificate Form 1* and the List of Construction Trades in Registered Apprenticeship Programs is available on the DLIR website at: <http://labor.hawaii.gov/wdd/>.
3. Upon receiving the Certification Form 1, the Procurement Officer will verify that the apprenticeship program is on the List of Construction Trades in Registered Apprenticeship Programs and that the form is signed by an authorized official of the Apprenticeship Program

Sponsor. If the programs and signature are not confirmed by the DLIR, the bidder will not qualify for the preference.

4. If the bidder is certified to participate in an apprenticeship program for each trade which will be employed by the bidder for the project, a preference will be applied to decrease the bidder's bid amount by five percent (5%) for evaluation purposes.
5. Should the bidder qualify for other preferences (e.g. Hawaii Products), all applicable preferences shall be applied to the bid price.

CAMPAIGN CONTRIBUTIONS BY STATE AND COUNTY CONTRACTORS PROHIBITED

If awarded a contract in response to this solicitation, offeror agrees to comply with HRS 11-355, which states that campaign contributions are prohibited from a State and county government contractor during the term of the contract if the contractor is paid with funds appropriated by a legislative body between the execution of the contract through the completion of the contract.

CONDITION OF AWARD

It is understood that the award of the contract will be made on the basis of the lowest responsible Total Sum Base Bid (Items 1 to 9) selected by the Board of Land and Natural Resources.

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

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

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

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

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

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

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

After the proposals are opened and read, the figures will be extended and/or totaled in accordance with the bid prices of the acceptable proposals and the totals will be compared. In the comparison of bids, words written in the proposal shall govern over figures and unit prices will govern over totals. Until the award of the contract, however, the right will be reserved to reject any and all proposals and to waive any defects or technicalities as may be deemed best for the interest of the State.

It is also understood and agreed that liquidated damages in the amount of THREE HUNDRED AND NO/100 DOLLARS (\$ 300.00) for each and every calendar day in excess thereof prior to completion of the contract shall be withheld from payments due to the Contractor.

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

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

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

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

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

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

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

RECEIPT OF ADDENDA

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

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

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

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

**JOINT CONTRACTORS OR SUBCONTRACTORS
TO BE ENGAGED ON THIS PROJECT**

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

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

General Engineering “A” Contractors automatically have these “C” specialty contractor’s

Enclosed herewith is a:

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

(Cross Out Those Not Applicable)

Dollars (\$ _____)

as required by law.

Respectfully submitted,

Name of Company, Joint Venture
or Partnership

Contractor's License No.

By _____
Signature (*4)

Title _____

Print Name _____

Date _____

Address _____

Telephone No. _____

NOTES:

1. Surety bond underwritten by a company licensed to issue bonds in this State;
2. Legal tender; or
3. A certificate of deposit; share certificate; or cashier's, treasurer's, teller's, or official check drawn by, or a certified check accepted by, and payable on demand to the State by a bank, a savings institution, or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration.
 - A. These instruments may be utilized only to a maximum of \$100,000.
 - B. If the required security or bond amount totals over \$100,000, more than one instrument not exceeding \$100,000 each and issued by different financial institutions shall be accepted.
4. Please attach to this page evidence of the authority of this officer to submit bids on behalf of the Company and also the names and residence addresses of all officers of the Company.
5. Fill in all blank spaces with information asked for or bid may be invalidated.
PROPOSAL MUST BE INTACT, MISSING PAGES MAY INVALIDATE YOUR BID.

End of Proposal

SPECIAL PROVISIONS

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

Section 2 – Proposal Requirements and Conditions

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

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

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

Hawaii Business or Compliant Non-Hawaii Business Requirement: Bidders shall be incorporated or organized under the laws of the State or be registered to do business in the State as a separate branch or division that is capable of fully performing under the contract, as stipulated in §3-122-112 HAR. A certified letter is not required prior to bid opening.

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

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

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

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

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

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

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

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

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

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

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

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

Section 3 – Award and Execution of Contract

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

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

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

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

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

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

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

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

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

Section 5 – Control of Work

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

Section 6 – Substitution of Materials and Equipment

ADD the following to Section 6.3 Sub-paragraph b:

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

Section 7 – Prosecution and Progress

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

“d. Insurance Requirements

1. Obligation of Contractor

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

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

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

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

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

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

2. Types of Insurance

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

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

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

The Contractor shall either:

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

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

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

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

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

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

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

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

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

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

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

Section 8 – Measurement and Payment

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

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

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

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

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

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

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

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SECTION 01019

GENERAL SPECIFICATIONS

PART 1 - GENERAL

1.01 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.

1.02 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 State Parks Division to obtain permission before visiting the site.
- C. Notices: The Contractor shall notify the State Parks Division 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. Work Along Trail

1. The Contractor shall not commence construction along trail until ALL approved material, tools, and equipment required for the project are stored in the staging area.
2. Work can be performed along the trail anytime between 2:00 p.m. and 5:00 a.m. Monday through Friday when the trail is closed. No work shall occur during Saturdays or Sundays. No work shall occur along the trail when the trail is open to the public. The trail will be open daily between 6:00 a.m. and 1:00 p.m. during the contract period. Work hours shall be coordinated with the State Park's staff and DLNR.
3. Rubbish, loose materials, etc. shall be disposed of daily. Materials, tools, and equipment shall be stored off the trail in an area designated by the Parks department. Each construction area shall be inspected at the end of the work day by the Contractor to certify that the trail is safe and passable by the public. Contractor to provide written confirmation at the end of day to the Engineer. A log of such inspection must be kept to certify inspection has been completed daily. If any unsafe conditions are found, Contractor will be notified and shall make the necessary corrections within 2 hours of the notification.
4. Trail Closure: Complete closure of the trail will only be allowed four (4) times for four (4) consecutive days (Monday through Thursday) each time, for a total of sixteen (16) working days during the sixty (60) calendar days of trail improvements work. Contractor shall coordinate work hours and full day closures with the State Park's staff and DLNR. Contractor shall give minimum thirty (30) days notice in advance of any full day closures. All closure requests must be reviewed and approved by the State prior to issuance.
5. No work shall be performed during State or Federal holidays.

G. Construction Schedule

Submit a proposed construction schedule to the Engineer, Diamond Head Park Coordinator, and the State for review and approval within 30 calendar days prior to the start of work. In addition during construction work, the Contractor shall issue a weekly revised schedule promptly on the first working day of each week. The weekly schedule shall forecast three weeks in advance and shall be updated when there is a change. The Contractor shall coordinate their schedule with the parties stated above if rescheduling of work is required, such work shall be performed at no extra cost to the State.

Work can only be done during one of the following dates:

1. After Labor Day September 5 through November 22, 2016
2. January 2 through March 3, 2017
3. Other period State determines

H. Trail Security

Contractor shall provide, at no additional cost to the State, security personnel to prohibit public access to the trailhead when the trail is closed for construction work. The security personnel must be employees of an established security guard company doing business in the State of Hawaii for at least the past 12 months. Security personnel must be capable of communicating verbally in English with the State personnel and the public. State will reserve the right to reject the security guard company if it is determined by the State that the security guard staff is not able to properly and fluently communicate in English with the public and the Park staff. Hours of duty will be as follows:

1. Trail is closed at 2:00 p.m. Provide security between 2:00 p.m. to 6:00 p.m.
2. Trail is closed for consecutive days. Provide security between 6:00 a.m. to 6:00 p.m. each working day.

The gate at the tunnel entrance to the crater is locked between 6:00 p.m. and 6:00 a.m. daily, so no security is required for those hours.

I. 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 State Parks Division. Any lawn damaged by the Contractor shall be restored as instructed by the Engineer at no cost to the State.

J. Toilet Accommodations: The Contractor may use the existing toilet facilities if so designated by the State; 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 State.

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.
- K. **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, railings, 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.
- L. **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.
- M. **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.
- N. **Health and Safety Plan:** The Contractor shall submit a health and safety plan to the Engineer for review and approval prior to construction.
- O. **Clean Up Premises:** The Contractor shall clean up and remove from premises all debris accumulated from operations as necessary or as directed. Park shall be clear of debris, equipment, and any other hazardous materials or tools and shall be safe for public use prior to park opening to the public. See also Section 7.25 of the General Conditions.
- P. **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.

- Q. 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.
- R. 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.
- S. 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.
- T. 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.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

The items in this General Specifications section will not be paid separately. Measurement for payment will not apply.

4.02 PAYMENT

Items in this General Specifications section will not be paid separately. The cost will be considered incidental to various contract items.

END OF SECTION

SECTION 01090

STANDARD REFERENCES

PART 1 - GENERAL

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

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

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

<u>Abbreviation</u>	<u>Company</u>
	New York, NY 10017
ASME	American Society of Mechanical Engineers 345 East 47th Street New York, NY 10017
ASTM	American Society for Testing and Materials 1916 Race Street Philadelphia, PA 19103
AWPA	American Wood Preservers Association 1625 Eye Street Washington, DC 20006
AWS	American Welding Society 2501 N.W. 7th Street Miami, FL 33125
AWWA	American Water Works Association 6666 West Quincy Avenue Denver, CO 80235
CBM	Certified Ballast Manufacturers 2120 Keith Building Cleveland, OH 44115
CMAA	Crane Manufacturers Association of American, Inc. (Formerly called: Overhead Electrical Crane Institute - OECI) 1326 Freeport Road Pittsburgh, PA 15238
CRSI	Concrete Reinforcing Steel Institute 180 North La Salle Street Chicago, IL 60601
CSA	Canadian Standards Association 178 Rexdale Boulevard Rexdale, Ontario, M9W 1R3, Canada
DEMA	Diesel Engine Manufacturer's Association 122 East 42nd Street New York, NY 10017

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

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

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

SAMA	Scientific Apparatus Makers Association One Thomas Circle Washington, DC 20005
SBCC	Southern Building Code Congress 1116 Brown-Marx Building Birmingham, AL 35203
SMACNA	Sheet Metal and Air Conditioning Contractors National Association, Inc. 8224 Old Courthouse Road Tysons Corner Vienna, VA 22180
SSPWC	Standard Specifications for Public Works Construction Building News, Inc. 3055 Overland Avenue Los Angeles, CA 90034
TEMA	Tubular Exchanger Manufacturer's Association 331 Madison Avenue New York, NY 10017
UBC	Uniform Building Code Published by ICBO
UL	Underwriters Laboratories Inc. 207 East Ohio Street Chicago, IL 60611
UMC	Uniform Mechanical Code Published by ICBO
UPC	Uniform Plumbing Code Published by IAPMO
USBR	Bureau of Reclamation U.S. Department of Interior Engineering and Research Center Denver Federal Center, Building 67 Denver, CO 80225
WWPA	Western Wood Products Association (Formerly called: West Coast Lumberman's Association - WCLA) Yeon Building

Portland, CA 97204

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

PART 4 – MEASUREMENT AND PAYMENT (NOT USED)

END OF SECTION

SECTION 01100

ARCHAEOLOGICAL PROTECTION

PART 1 - GENERAL

1.01 GENERAL CONDITIONS

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 CONSTRUCTION METHOD:

- A. DLNR will from time to time examine the area as work proceeds.
- B. The Contractor shall notify the State if he/she finds anything suspected to be of historic significance and shall discontinue further work in the vicinity of the find until the State can examine the area.
- C. 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.
- D. 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 required more than one month.
- E. If human remains are inadvertently discovered during construction, all work in the vicinity of the find will cease and the Contractor shall immediately notify the Honolulu Police Department and the Engineer and DLNR-SHPD (phone:692-8015). Procedures will follow the Hawaii revised Statutes Chapter 6E-43. Construction in the vicinity of the remains will not resume until an appropriate Burial Treatment Plan is approved and has been implemented.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Archaeological Protection will not be paid separately. Measurement for payment will not apply.

4.02 PAYMENT

Archaeological Protection will not be paid separately. The cost will be considered incidental to the various contract items.

END OF SECTION

SECTION 01300

SUBMITTALS

PART 1 - GENERAL

1.01 SUBMITTALS

A. Shop drawings shall be required for:

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

B. Other required submittals shall include:

1. Manufacturer's Data.

2. Certificates of Warranty.

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

A list of mandatory submittals is provided in Subsection 1.03 of this section. See respective sections in these documents for submittal requirements.

1.02 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 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 and/or catalog cuts for fabricated items and manufactured items 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.

1.03 EXPECTED SUBMITTALS

Submittal		Reference	
		Special Provisions	Plans
Miscellaneous Submittals			
1	Public Notice in Newspaper		
2	Community Noise Permit (as needed)		
3	Street Usage Permit (as needed)		
4	Health and Safety Plan	01019.1.02.N	
5	Fall Protection Plan		C-1, Construction Note 10
	Public Safety Plan		C-1, Public Health, Note 7
6	Site Specific BMP Plan		
7	Construction Schedule	01019.1.02.G	
8	As-Built Drawings	01019.1.02.T.3	

Rock Scaling Submittals			
1	Contractor Qualifications/Experience	02232.1.02	
2	Project Reference List	02232.1.02	
3	Method Statement/Work Plan	02232.1.04	
Grouted Anchors and Rock Dowels Submittals (Items 1-3 shall be submitted for both Grouted Anchors and Rock Dowels)			
1	Qualifications of the Company	02268.1.02.A	
2	Qualifications of Personnel	02268.1.02.B	
3	Anchoring Plan	02268.1.02.C	
4	Color Sample for Grout Plug	02268.3.01	
Shotcrete Submittals			
1	Shotcrete Mix Design	03361.1.02.A 03361.3.01	
2	Proposed Equipment Information	03361.1.02.B	
3	Qualifications of Nozzle Operator	03361.1.02.C	
4	Shotcrete Work Plan	03361.1.02.D	
5	Pre-Construction Test Panels/Samples and Testing Results	03361.2.01	
6	Test Panels (During Construction)	03361.2.02	
7	Curing Compound Compatibility Certification from Manufacturer	03361.3.09.D	
8	Fiber Reinforced Polymer (FRP) Reinforcing Dowels	03361.2.06.E	
9	Geocomposite Drain Manufacturer's Product Data	03361.2.06.F	
Sculpted Shotcrete Finish Submittals			
1	Project Reference List	03362.1.02.A	
2	Personnel Qualifications	03362.1.02.B 03362.1.02.C	
3	Shotcrete Mix Design and Stain Color Data Sheets	03362.1.04	
4	Pre-Construction Test Panels	03362.1.04B 03362.1.05	

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Submittals will not be paid separately. Measurement for payment will not apply.

Submittals
01300-4

4.02 PAYMENT

Submittals will not be paid separately. The cost will be considered incidental to various contract items.

END OF SECTION

SECTION 01505

MOBILIZATION AND DEMOBILIZATION

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

This section covers the requirements for mobilization and demobilization.

1.02 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.

1.03 DEMOBILIZATION

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GUIDELINES

- A. Contractor shall coordinate access to the site and mobilization with the State.
- B. Any and all additional mobilization or demobilization costs in excess of the maximum amounts specified in the Proposal shall be included in the appropriate unit prices bid in the Proposal. The Contractor shall not receive any compensation for mobilization and demobilization in addition to those specified in the Proposal.
- C. All equipment, machinery, buildings, utilities and incidentals mobilized and demobilized under this section shall remain the property of the Contractor.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Mobilization and Demobilization will be paid on a lump sum basis. Measurement for

payment will not apply.

4.02 PAYMENT

Mobilization and Demobilization will be paid on a lump sum basis and shall not exceed 10% of the total bid price. Payment will be full compensation for the work prescribed in this section and the contract documents.

END OF SECTION

SECTION 01519

TEMPORARY CONSTRUCTION

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

This section covers work related to the construction of temporary installations, walkways, covers, bridges, ramps, and railings.

Temporary installations, walkways, bridges, ground cover and railings will be placed throughout construction project where necessary to provide safe adequate access along trail during construction and to allow for safe passage by the public when the park is open to trail users. The decision to use temporary construction installations throughout the trail for temporary access during park openings will be at the discretion of the Contractor and must adhere to the items specified within this section.

1.03 SUBMITTALS

Contractor to provide shop drawings and applicable calculations of all temporary construction structures and installations, walkways, bridges, ground covers, railings, ramps, etc. for approval by the Engineer. The shop drawings must provide material information, temporary construction installation design including connections and dimensions, tie down and anchoring locations and demonstrate that the temporary construction will support any loads expected upon each installation.

PART 2 - PRODUCTS

2.01 MATERIALS

- A. Materials used shall be of quality not less than required by applicable published Local, State and Federal codes and specification standards. All materials experiencing pedestrian use required to be structurally competent in withstanding and supporting pedestrian use loads.
- B. Temporary construction installations, walkways, bridges, ramps or covers shall provide access widths of at least 3' wide and shall be structurally capable of handling applicable loads created by pedestrian usage.
- C. All temporary construction installation, walkway, bridge, ramps or covers that will experience pedestrian foot traffic shall be made slip resistant when dry or wet.

- D. All temporary construction will be anchored and/or tied down securely such that the temporary construction installation will not move or wobble when used.
- E. All temporary railings constructed will be at least 3'-6" in height and will have a horizontal rail at the mid span of this height.
- F. Temporary barricades, signage or obstructions will be installed to prevent pedestrians and users from entering construction areas along the trail.

PART 3 - EXECUTION

3.01 CONSTRUCTION REQUIREMENTS

- A. General: Temporary construction installations will be provided along trail as necessary where access is made hazardous to construction workers and trail users during the improvement of the trail.
 - 1. Temporary construction installations may be required for improvements which are not fully completed during park closure. During hours when park is open to users, all incomplete improvements will required temporary construction measures for safe passage. Contractor shall not perform any work during hours when the park is open without prior written approval from the State.
- B. Temporary construction will be installed such that there is no damage outside of each area of work. If damages result from temporary construction installation, the areas of damage shall be repaired and restored at the Contractor's expense.
- C. Temporary construction installations will be inspected daily to ensure safe usage. Any temporary construction installation that will experience pedestrian use during park operating hours will be certified by the Contractor at the end of work the day prior to the opening of the trail. Contractor to provide written confirmation at end of the day to the Engineer. Any unsafe conditions found and/or observed shall be corrected within 2 hours after notification is given to the Contractor.

3.02 CLEANING

- A. General: During the process of work, keep premises free from unnecessary accumulation of tools, equipment, surplus materials and debris resulting from work under this section. At the conclusion of work, leave the premises neat and clean to the satisfaction of the Engineer.
- B. Temporary construction installations that accommodate pedestrian access will be cleaned free of debris and obstructions for safe passage.

- C. Temporary construction shall be removed and cleared upon completion of work and properly disposed of.

PART 4 – MEASUREMENT AND PAYMENT

Temporary Construction will not be paid separately. The cost will be considered incidental to the various contract items.

END OF SECTION

SECTION 01567

POLLUTION CONTROL

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

A. Rubbish Disposal

1. No burning of debris and/or waste materials shall be permitted on the project site.
2. No burying of debris and/or waste material except for materials which are specifically indicated elsewhere in these specifications as suitable for backfill shall be permitted on the project site.
3. All unusable debris and waste material shall be hauled away to an appropriate off-site dump area. During loading operations, debris and waste materials shall be watered down to allay dust.
4. No dry sweeping shall be permitted in cleaning rubbish and fines which can become airborne from floors or other paved areas. Vacuuming, wet mopping or wet or damp sweeping is permissible.
5. Enclosed chutes and/or containers shall be used for conveying debris from above to ground floor level.
6. Clean-up shall include the collection of all waste paper and wrapping materials, cans, bottles, construction waste materials and other objectionable materials, and removal as required. Frequency of clean-up shall coincide with rubbish producing events.

B. Dust

1. The Contractor shall prevent dust from becoming airborne at all times including non-working hours, weekends and holidays in conformance with the State Department of Health, Administrative Rules, Title 11, Chapter 60 - Air Pollution Control.
2. The method of dust control and costs shall be the responsibility of the Contractor. Methods of dust control shall include the use of water, chemicals or asphalt over surfaces which may create airborne dust.

3. The Contractor shall be responsible for all damage claims in accordance with Section 7.16 - "Responsibility for Damage Claims" of the GENERAL CONDITIONS.

C. Noise

1. Noise shall be kept within acceptable levels at all times in conformance with the State Department of Health, Administrative Rules, Title 11, Chapter 46 - Community Noise Control for Oahu. The Contractor shall obtain and pay for the Community Noise Permit from the State Department of Health when the construction equipment or other devices emit noise at levels exceeding the allowable limits.
2. All internal combustion engine-powered equipment shall have mufflers to minimize noise and shall be properly maintained to reduce noise to acceptable levels.
4. Starting-up of construction equipment meeting allowable noise limits shall not be done prior to 6:45 a.m. without prior approval of the Engineer. Equipment exceeding allowable noise levels shall not be started-up prior to 7:00 a.m.

D. Erosion

1. Grades shall be maintained so as to preclude any damage from water and eroding soil.
2. Temporary berms, cut-off ditches and other provisions which may be required because of the Contractor's method of operations shall be installed at no additional cost to the State.
3. Best Management Practices (BMPs) shall be implemented and maintained as shown on the plans to minimize erosion and pollution of waterways during construction.

E. Others

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

3. No dumping of waste concrete will be permitted at the job-site.
4. Except for rinsing of the hopper and delivery chute, and for wheel washing where required, concrete trucks shall not be cleaned on the job-site.
5. Except in an emergency, such as a mechanical breakdown, all vehicle fueling and maintenance shall be done in a designated area. A temporary berm shall be constructed around the area when runoff can cause a problem.
6. When spray painting is allowed such spray painting shall be done by the "airless spray" process. Other types of spray painting will not be allowed.

F. Suspension of Work

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

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION (NOT USED)

PART 4 - MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Pollution Control including Best Management Practices (BMPs) will not be paid separately. Measurement for payment will not apply.

4.02 PAYMENT

Pollution Control including Best Management Practices (BMPs) will not be paid separately. The cost will be considered incidental to various contract items.

END OF SECTION

SECTION 02100

SITE PREPARATION

PART 1 - GENERAL

1.01 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.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

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

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

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

3.02 EXISTING UTILITY LINES

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

3.03 TRAIL CLEAN UP

The Contractor shall remove all construction materials and equipment from the trail prior to the opening of the trail to the public. Conditions of the trail will be observed and inspected by the Engineer to ensure safe passage to trail users prior to opening. Engineer shall accept the trail condition or have the contractor improve the conditions prior to opening the trail to the Engineer's satisfaction.

3.04 CLEAN UP OF PREMISES

Clean up and remove all debris accumulated from Contractor 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, etc., and leave entire jobsite clean and neat to the satisfaction of the Engineer.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Site Preparation will not be paid separately. Measurement for payment will not apply.

4.02 PAYMENT

Site Preparation will not be paid separately. The cost will be considered incidental to various contract items.

END OF SECTION

SECTION 02150

CLEARING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

The work to be performed under this section shall include clearing trees and vegetation, and objects designated for removal and disposing of vegetation, debris, and unwanted material from the project site as designated in the contract documents or by the Engineer. Perform clearing in advance of proposed improvements and mitigation measures.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.01 GENERAL

- A. Best Management Practices (BMP): Ensure that all BMP measures are in place before clearing and debris removal starts. If BMP measure is removed temporarily to accommodate construction operations, reinstall before end of workday.
- B. Limits: Clear within locations and areas specified in the contract documents. Clearing shall include all vegetation and debris encountered within the limits of proposed improvements including, but not limited to, rock scaling, shotcrete, etc. Contractor shall coordinate limits of clearing in the field with the Engineer.
- C. Clearing. All vegetation and surface objects encountered within the limits of clearing including trees, logs, roots of downed trees, brush, grass, weeds, etc. shall be cleared and cut flush to the ground. Trees with a trunk diameter equal to or less than 12 inches shall be cut flush with the ground. Trees with a diameter larger than 12 inches shall remain.

Clearing shall also include removal of other unwanted material, such as trash and loose debris.

- D. Removal and Disposal of Material. All material and debris resulting from clearing operations shall become the property of the Contractor and shall be removed from the site to an approved location.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Clearing will not be paid separately. Measurement for payment will not apply.

4.02 PAYMENT

Clearing will not be paid separately. The cost will be considered incidental to Rock Slopes Scaling.

END OF SECTION

SECTION 02232

ROCK SLOPE SCALING

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS:

This section describes furnishing materials, labor, and equipment necessary to perform rock slope scaling when ordered by the Engineer in accordance with the contract documents.

Rock Slope Scaling is defined as removal of loose or unstable rocks, soil, and debris from the slope face or ground surface utilizing hand scaling bars and non-destructive methods within the scaling limits and/or areas provided on the plans and as directed by the Engineer in the field, including those boulder locations specifically identified on the contract documents, which meet the criteria for scaling. Rock Slope Scaling shall also include clearing of vegetation as described in Section 02150 – Clearing.

Additional Rock Slope Scaling is defined as the same as Rock Slope Scaling above, except the locations are not specifically identified on the plans. Additional Rock Slope Scaling shall be performed throughout the trail at locations identified by the Engineer in the field. Only areas designated by the Engineer shall be scaled as part of Additional Rock Slope Scaling. Any further scaling beyond the direction of the Engineer shall be at the Contractor's expense. See Subsection 3.01.J for details.

The Contractor shall be responsible for the safety of public and any necessary means of achieving public safety. Exercise care when performing work next to existing improvements, infrastructure, and facilities adjacent to the project site. Damages to existing improvements shall be immediately reported to the State and repaired at no additional cost to the State.

The Contractor shall indemnify, defend and hold harmless the State of Hawaii, and their officers, employees, agents, or any person acting on their behalf from and against:

- A. Any claim or demand for loss, liability or damage, including, but not limited to, claims for property damage, personal injury or death, by whomsoever brought, arising from any accident or incident connected with the performance of this contract except liability arising out of the sole negligence of State or its employees.

- B. All claims, suits and damages by whomsoever brought or made by reason of the nonobservance or nonperformance of any of the terms, covenants and conditions herein or the rules, regulations, ordinances and laws of the federal, state, municipal or county governments.

Furthermore, the Contractor shall reimburse the State of Hawaii and their officers, employees, agents, or any person acting on their behalf for all attorneys' fees, costs, and expenses incurred in connection with the defense of any such claims. The Contractor shall pay all just claims for materials, equipment, supplies, tools, labor and other just claims against the Contractor or any Subcontractor in connection with this contract. The State 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 State to cover such just claims until satisfactory proof of payment or the establishment of a payment plan is presented.

1.02 CONTRACTORS QUALIFICATIONS AND WORK PLAN:

The Contractor performing the slope scaling work must have performed satisfactory slope scaling for a minimum of five (5) years or employ the services of a specialty subcontractor with a minimum of five years of satisfactory slope scaling experience. The Contractor or Subcontractor shall submit a project reference list containing at least five projects in which similar work has been conducted and successfully completed within the past five years. Include a brief description of each project including the typical heights of the slopes scaled, duration of the slope scaling, working hours on the slope, methods employed to scale the slopes, the Owner's name, and current telephone number for reference.

At a minimum, the slope scaling crew shall consist of one scaling supervisor and two (2) slope scalers. For additional slope scaling crews, each slope scaling crew shall consist of one scaler foreman (in-lieu of the scaling supervisor) and two (2) slope scalers. The number of slope scaling crews to be employed on this project shall be determined by the Contractor or specialty subcontractor performing the slope scaling.

The slope scaling operations shall be conducted within the times and duration specified on the Contract drawings. Contractor shall coordinate scaling hours with the State and the Engineer. If necessary, pedestrian traffic control measures shall be utilized to provide for protection of the public.

- A. Scaling Supervisor

The Contractor's designated representative responsible for the prosecution and coordination of slope scaling activities on this project. The scaling supervisor shall be in charge of and responsible for the safety and work performed by the slope scaling crews. The scaling supervisor shall have a minimum of five (5) years of high slope scaling experience with a minimum of 2,000 hours of demonstrated experience supervising slope scaling. The scaling supervisor shall have completed the American Red Cross "basic first aid course" or equivalent, and shall have experience or training in the use of emergency remote rescue techniques.

B. Scaler Foreman

An individual who is directly in charge of and responsible for the safety and work performed by a crew of two (2) slope scalers. The scaler foreman shall be actively engaged at the site location and shall be engaged in actual slope scaling activities for at least 50% of the time charged for his/her slope scaling crew. The scaler foreman shall have a minimum of three (3) years of high slope scaling experience with a minimum of 2,000 hours of demonstrated experience performing slope scaling. Scaler foremen shall have completed the American Red Cross "basic first aid course" or equivalent, and shall have experience or training in the use of emergency remote rescue techniques.

C. Slope Scaler

An individual who is engaged in accessing the slope face and demolishing and removing loose rock and materials from the slope face using a variety of hand tools at locations that require modified rock climbing techniques for the safe prosecution of the work. Slope scalers shall have a minimum of two (2) years experience with a minimum of 1,000 hours of demonstrated experience performing similar slope scaling work.

Approval or denial of the Contractor's qualifications and personnel will be made after review of the submittal. Slope scaling work shall not commence until approval of the Contractor's qualifications and work plan has been obtained in writing from the Engineer. The Engineer will suspend the work if the Contractor substitutes unqualified personnel for approved personnel during construction.

1.03 PROTECTION OF EXISTING FACILITIES:

Existing structures, utilities, and other items of properties to remain shall be protected from damage during rock scaling. Any damage resulting from the Contractor's operations to existing structures, utilities, or other items of property shall be repaired by the Contractor, using materials and construction equal to or better than existing, all at the Contractor's own expense and the satisfaction of the State.

Provide, install, and maintain all necessary signs, lights, flares, barricades, markers, cones, and other protective devices and take all necessary precautions for the protection, convenience, and safety of vehicles, people, and the surrounding properties. The existing slope and all other improvements shall be fully protected during the scaling operations. Exercise care when performing work next to existing infrastructure.

1.04 SUBMITTALS:

Submit three (3) copies of a method statement, reflecting how the contractor plans to perform his/her rock slope scaling operations including details and methods for protection of the public and all existing improvements, performing the rock scaling, removing the debris, disposal location, names and qualifications of the slope scaling crew(s), work hours, and all necessary equipment.

Submit a list identifying the scaling supervisor, scaler foremen, and slope scalers assigned to this project. In this list, the Contractor shall summarize the individual's experience for the Engineer to determine whether the qualifications of each individual meet the minimum requirements of the scaling supervisor, scaler foremen, and/or slope scalers as described by this section.

The Contractor shall provide a detailed work plan of the slope scaling work, prior to any such activity, which includes the following items, as a minimum, for review by the Engineer. The Engineer shall have a minimum of ten (10) working days after receipt of the submittal to review and provide comments to the submittal. The work plan shall be approved by the Engineer prior to commencement of the slope scaling work. Include in the work plan the following:

- A. The proposed construction sequence and schedule to complete the slope scaling work.
- B. The types of equipment and hand tools to be used for the slope scaling activities.
- C. The number of slope scaling crews including the number of scaling supervisor(s), scaler foremen, and slope scalers to be employed on the project.
- D. Provisions to protect the public, facilities, utilities, pavement surface, and personnel below the scaling area. All public protection measures should be in place and operational before starting scaling each day.
- E. Removal and disposal plan for debris generated from the slope scaling work at the end of each shift. All scaled debris should be removed from the trail at the end of each day.

PART 2 – PRODUCTS

Not used.

PART 3 - EXECUTION

3.01 GENERAL:

- A. All scaling activity shall be monitored by the Engineer. Contractor shall notify the Engineer at least three (3) business days in advance of any scaling work. No section of slope will be considered completed until accepted by the Engineer.
- B. The Contractor shall perform the slope scaling work according to the approved work plan and as directed by the Engineer. Maintain the minimum crew size specified and the number of slope scaling crews described in the work plan at all times. Any member of the slope scaling crew who must leave for any reason shall be replaced immediately by a qualified replacement. Do not perform slope scaling when the scaling supervisor is absent, unless an alternate supervisor meeting all the requirements of the scaling supervisor has been designated for the slope scaling work to continue. Deviation from these rules will result in non-payment.
- C. Conduct a pre-construction condition survey of the adjacent area that may be impacted by the rock slope scaling operations prior to commencement of the scaling work.
- D. Rock slope scaling work shall begin only after protection measures are in place and operational.
- E. Clear the slope in accordance with Section 2150 – Clearing.
- F. Start rock slope scaling at the top of the slope and proceed down slope, removing loose rocks and other debris as the work progresses. Material on the slope face that is loose, hanging or creates a safety hazard to the public, regardless of size, shall be removed to the Engineer's satisfaction.
- G. Scale, trim flush, and/or remove rock outcrops if said rock outcrops are unstable and hazardous, as determined by the Engineer. Blasting will not be permitted on this project.
- H. Remove all rock debris that hang up on the slope during scaling operations at completion of the first pass of the slope scaling. Continue scaling of the slopes until the slope scaling has been completed to the satisfaction of the Engineer.
- I. Exercise care in the slope scaling work and avoid over-steepening the slope face that may cause instability of the slope. Immediately stop all work and notify the Engineer if unsafe slope conditions are encountered that may constitute a potential slide.

- J. Contractor shall be prepared to perform Additional Rock Slope Scaling at locations identified in the field, but not specified on the plans at the discretion of the Engineer up to the quantities in the Proposal. During scaling operations, hazardous areas not within the specified limits of scaling on the plans may be discovered by the Engineer that require rock scaling and removal. These areas will be flagged by the Engineer for Additional Rock Slope Scaling. Any other areas outside the limits of scaling that the Contractor believes is hazardous and requires scaling, shall be brought to the Engineer's attention for review. Contractor shall not begin scaling these areas until it has been approved by the Engineer for Additional Rock Slope Scaling. Contractor shall scale the area, removing the loose material as directed by the Engineer. Any further scaling beyond the Engineer's direction will be at the Contractor's expense.
- K. Scaled material shall be bagged on slope to be air-lifted away and shall not be allowed to roll down the trail or the side slopes of the trail. Scaled material shall not be stored on the trail during open hours. All scaled material shall be removed from the site unless directed otherwise by the Engineer. Existing slope surface and vegetation shall be protected to the maximum level possible.
- L. The Contractor shall make all necessary arrangements to obtain any required permits for the use of off-site disposal locations.
- M. Each rock slope scaling crew shall consist of one working supervisor and at least two (2) experienced slope scalers. The supervisor shall be available to enable the Engineer to communicate with the slope scaling staff for safety considerations. Determine the number of slope scaling crews to be employed on this project based on the extent of the rock slope scaling to be performed and the duration available for performing the work as specified in the contract documents.
- N. All slope scaling staff shall be experienced in working on steep slopes with use of fall protection devices.

3.02 MEASUREMENT:

Rock Slope Scaling shall be paid on a lump sum basis, inclusive of all labor (crew), vegetation clearing, bagging and removal, and proper disposal of scaled material, complete within the identified scaling limits. Measurement for payment does not apply.

Additional Rock Slope Scaling shall be measured at the contract price per crew day. A working "crew" shall be defined as one (1) scaling supervisor and two (2) slope scalers as described in Section 1.02. A "crew day" shall consist of a total of 8 hours of scaling work performed by a full working crew. Any time scaled with fewer personnel than a full working crew and/or fewer than 8 hours of scaling will result in partial payment as computed from the definition of a crew and a crew day defined in this section. Only actual time on the slope performing scaling work shall be accounted for in the measurement of a

crew day. All other time spent with preparation work and cleaning up debris shall not be included. Only areas identified by the Engineer will be accepted. Scaling without the Engineer present will not be recognized. All other costs of labor and equipment shall be considered incidental work and shall not be measured for payment.

All mobilization and demobilization work, including installing fall protection anchors, lines and devices, site safety for the crew during work, installing and maintaining traffic control and miscellaneous protection devices, and removal and cleaning up debris, all in regards to rock scaling work, shall be considered incidental work, and shall not be measured for payment.

3.03 PAYMENT:

Rock Slope Scaling will be paid on a lump sum basis for the accepted work performed within the limits of scaling on the plans, under this section and in accordance with the contract documents.

Additional Rock Slope Scaling will be paid at the contract unit price per crew day. Scaling of rocks from areas not indicated by the Engineer or beyond the Engineer's measurements will not be accepted.

END OF SECTION

SECTION 02268

GROUTED ANCHORS AND ROCK DOWELS

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

This work shall consist of installation of grouted anchors and rock dowels in accordance with the design documents at the locations shown on the plans or as directed by the Engineer. The Contractor shall install grouted anchors and rock dowels as specified by the design plans, and supply all materials, equipment, and labor required for the installation of the grouted anchors and rock dowels specified herein.

Grouted anchors shall be installed as shotcrete anchorage.

Grouted rock dowels shall be installed to stabilize rock outcrops.

1.02 SUBMITTALS

The Contractor shall submit in writing, not less than two weeks prior to the beginning of the drilling, to the Engineer for approval the following items for both the grouted anchors and rock dowels, two (2) submittals:

- A. Qualifications of the Company. The company shall have a minimum of five (5) years of experience in the installation of similar types of anchors and rock dowels. Provide a project reference list verifying the successful completion of projects of similar nature and magnitude.
- B. Qualifications of the Contractor's personnel. The foreman and the drill operator shall have a minimum of two years of demonstrated experience in the installation of similar anchors and rock dowels. Provide resumes for the foreman and each drill operator summarizing each individual's experience.
- C. The Contractor shall submit a detailed plan. The plan shall detail:
 - 1. The proposed construction sequence.
 - 2. The proposed drilling methods and equipment.

3. The proposed grout mix design specifications, including manufacturer's data sheets and catalog cuts, plus the procedure and equipment used for placing the grout or epoxy adhesive.
4. The proposed anchor and coupler specifications, including manufacturers' data sheets and catalog cuts.
5. A detailed schedule of work for performing grouted anchor and rock dowel installation, including final cleanup and washing of grouting equipment.

D. Work shall not begin until the plan has been approved in writing by the Engineer.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Grouted Anchors

Anchors shall be #8 hot-dipped galvanized solid threaded bar grade 75.

B. Rock Dowels

Dowels shall be ¾" diameter Type 316 stainless steel solid threaded bar.

C. Grout

Grout for the anchors and rock dowels shall consist of cement grout capable of permanently developing the bond and internal strength necessary for the project. Cement grout shall be non-shrink, non-metallic, high strength pre-engineered packaged grout with a minimum compressive strength of 5,000 psi in three (3) days when mixed to flowable consistency. If a non-prepackaged grout is used the Contractor shall submit to the Engineer for review and approval, the desired mix design along with compression test results performed by an independent laboratory specifically for this project proving the mix will achieve the minimum compressive strength specified above. Submit all grout material mix design information and compression test results, performed by an independent laboratory for the purpose of this project, to the Engineer for approval. Grout that achieves the specified three (3) day compressive strength will be considered acceptable for the project. Grouting shall not commence until the grout is approved in writing by the Engineer. Cement grout shall be capable of being hydraulically pumped to the bottom of the drill hole allowing it to rise upwards filling all cavities of the drill hole.

Water for mixing grout shall be potable, clean and free of injurious quantities of substances known to be harmful to Portland cement or bar steel.

Equipment for mixing grout shall be high speed colloidal mixer with shearing action. The grouting equipment shall be capable of continuous mixing and shall produce a homogeneous grout mixture free of lumps. Batch mixing shall be per manufacturer's recommendations.

D. Centralizers

Centralizers shall be placed along the length of the anchor as detailed in the plans, with no less than two per bar. Centralizers shall permit the free flow of grout to pass through in the anchor hole. Centralizers shall be made of PVC schedule 40 and shall be the size so to keep the bar at the center of the drilled hole. Any anchor bar that is not in the center of the hole (a deviation from the center of the drilled hole equal to 8% of the hole diameter or 0.5 inches, whichever is smaller, will be permitted) shall be rejected and replaced at no additional cost to the State.

PART 3 - EXECUTION

3.01 INSTALLATION

The anchors and dowels shall be handled and stored in such a manner as to avoid damage. Damage to the bars as a result of abrasions, rust, cuts, nicks, welds, and weld splatter will be cause for rejection. The bars shall be protected from dirt and harmful substances.

Prior to installation, all mill scale and grease shall be removed from the bar.

All dowels and anchors shall be inspected and approved, for not having coating damage, by the Engineer prior to installation. Any dowel or anchor installed and not approved shall be rejected and replaced with new dowels/anchors without any additional cost to the State.

The Contractor shall drill holes to receive the anchors and/or rock dowels to the diameters and lengths specified by the design documents. Drilling locations and orientations shall be coordinated in the field with the Engineer. The Contractor shall clean flush the drill holes of all drill cuttings, sludge, and debris with compressed air and install the anchor and/or rock dowel in the presence of the Engineer prior to the grouting. The Engineer reserves the right to observe the cleaning process and bar insertion. Any anchor or rock dowel grouted without the Engineer witnessing proper flushing of the drill hole and bar installation may be grounds for rejection at the Contractor's expense.

Holes drilled for anchors or dowels, in which installation is considered by the Engineer to be impractical, shall be grout filled and re-drilled at the Contractor's expense. All unused holes shall be grout filled and capped with sculpted grout at the Contractor's expense.

Anchors and dowels must be installed at the center of the drilled hole. A deviation from the center of drilled hole equal to 8% of the hole diameter or 0.5 inches, whichever is smaller, will be permitted. Install centralizers on each anchor bar as shown on the plans. Centralizers shall be securely fastened to prevent displacement. If the Contractor chooses to make drill holes larger than the minimum parameters specified on the plans, the centralizer sizing shall be adjusted to keep the anchor or dowel centered in the drilled hole. Any installed anchor or dowel not centered in or touching the side of the hole shall be grounds for rejection of anchor or dowel at the Contractor's expense. All rejected anchors and dowels shall be replaced at no additional cost to the State.

The Contractor shall notify the Engineer in writing at least three (3) working days, excluding weekends and holidays, prior to any scheduled grouting operation, at which time the Contractor shall provide the Engineer with a schedule of grouting. Grouting shall be performed according to the schedule and must be observed by the Engineer. Grouting performed not in the presence of the Engineer shall be grounds for rejection of the anchor or dowel at the Contractor's expense. All rejected anchors and dowels shall be replaced at no additional cost to the State.

It is anticipated that the Contractor may encounter cracks and fractures within the subsurface during drilling and grouting operation. The Contractor shall be prepared to manage complete grouted anchor or dowel installation under the above conditions without any additional cost to the State. Use of grout socks requires a written approval from the Engineer. Contractor shall make every effort to provide reasonable justification to the Engineer for using grout socks. Grout socks shall be of the materials which allow passage of cement water to the surrounding anchor hole area. Grout sock diameter shall be a minimum of 40% larger than the drilled holes. Contractor shall submit grout sock information for approval by the Engineer prior to installation.

Grout shall be pumped into the bore hole from the bottom to the top. Mix the grout according to the grout manufacturer's instructions for flowable consistency. Pump the grout into the borehole through a pre-inserted grout tube that extends to the bottom of the hole. The grout tube shall be temporarily fastened to the end of the anchor bar prior to inserting the bar into the hole. The end of the grout tube shall remain in the grout until the hole is completely filled to the top. No top grouting will be allowed. All grout tubes must be removed immediately after grouting is completed.

Avoid spilling grout, wet or dry, onto the work area. All spilled grout shall be completely removed from the rock surface and disposed of, and the area shall be restored to its natural conditions by the Contractor at no additional cost to the State.

No tension loading will be applied to grouted anchors or rock dowels.

All bore holes and bars for rock dowels shall be covered with a grout plug as specified on the drawings after the grout has completely cured. Contractor shall notify the Engineer prior to installation of grout plug for inspection of the anchor and/or dowel. Installation of grout plug without the Engineer's approval of the anchor or dowel will result in rejection of the anchor or dowel. Grout plug color should match the surrounding rock surface. Grout plugs that fail to match surrounding rock color shall be removed and replaced at the Contractor's expense. Contractor shall submit color samples to the Engineer for approval prior to installation.

3.02 TESTING

Testing of grouted anchors and rock dowels will not be required. All grouting must be performed in the presence of the Engineer. Allow at least three (3) working days advanced notice excluding weekends and holidays prior to grouting. No grouting shall take place without the Engineer being present. Any anchor or rock dowel grouted without the presence of the Engineer shall be cause for rejection at no cost to the State. Prior to grouting, upon the request of the Engineer, the Contractor shall provide proof of drilled hole depth.

3.03 FINAL CLEANUP

All work area, including vegetation, shall be clean and free of grout and cement residue. Clean all spilled grout from the exposed rock surfaces. All rocks, debris, and surplus earth resulting from work of this section shall be relocated on site at a location approved by the Engineer.

All equipment wash water shall be contained and disposed of offsite. No wash water shall be dumped on site. No equipment shall be washed on the park grounds without proper containment apparatus that has been pre-approved by the Engineer.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Grouted Anchors installed as shotcrete anchorage shall not be measured for payment and shall be considered included in the contract price bid for shotcrete. All costs of mobilization, materials, labor, equipment, and clearing shall be considered included.

Rock Dowel installation for specified boulder sites shall be measured at the contract price per linear foot of dowels completely installed and accepted in accordance with the contract documents. All other costs of material, labor, and equipment shall be considered incidental work and shall not be measured for payment.

4.02 PAYMENT

The cost for Grouted Anchors installed as shotcrete anchorage shall be considered included in the contract price bid for Shotcrete.

The accepted Rock Dowels shall be paid at the contract unit price per linear foot. The unit price is full compensation for furnishing and installing all materials, labor, equipment, tools, and other incidentals as indicated in the contract documents.

END OF SECTION

SECTION 03361

SHOTCRETE

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS

This section describes furnishing and placing shotcrete (pneumatically applied mortar). Shotcrete consists of pneumatically applied mortar using either the dry-mix or wet-mix process. The Contractor shall place as specified by the design plans or as directed by the Engineer, and supply all materials, equipment, and labor required for the installation of the shotcrete as specified herein.

1.02 SUBMITTALS

The Contractor shall submit in writing, not less than two weeks prior to the beginning of the shotcreting, to the Engineer for approval of the following items:

- A. Submit proposed mix design.
- B. Submit proposed equipment, manufacturer's specifications, and operating instructions.
- C. Submit a resume for each proposed nozzle operator. Nozzle operators shall have at least two years of experience in this type of work. Nozzle operator may be apprentice with at least six months of experience if supervised by foreman in charge with at least two years of nozzle operator experience. ACI certification shall be submitted for each nozzle operator assigned to the project.
- D. Submit a work plan including equipment washing and final cleanup.

PART 2 – QUALITY CONTROL/QUALITY ASSURANCE

The Contractor shall hire and pay for an independent testing lab to perform all required laboratory tests on shotcrete as described in these documents. Testing lab shall adhere to all applicable ASTM standards and requirements.

2.01 PRECONSTRUCTION TESTING

Pre-Construction testing shall be performed to check mix design, equipment, and qualification of nozzle men. Test panels shall be produced using the same personnel and equipment that was proposed for this project.

Prepare one (1) preconstruction test panel in accordance with ASTM C 1140 for each proposed mix proportion, each anticipated shooting orientation, and each proposed nozzle operator. Make test panels at least 30 inches square with the same thickness as in the structure, but not more than 6 inches. Provide reinforcement of the same size and spacing required for the work. Obtain six test core specimens from each panel, as described in Subsection 2.01.A and 2.01.B below. Shooting of test panels and all coring shall be performed in the presence of the Engineer. Contractor shall notify the Engineer at least three (3) days in advance of shooting the test panels. Test panels and core samples produced without the Engineer present shall be rejected and any work required for additional testing shall be at the Contractor's expense. All test results shall be submitted to the Engineer for review and approval prior to placing any shotcrete on site. Job shotcrete placed without the Engineer's written approval of the pre-construction test results shall be rejected and removed/replaced at the Contractor's expense.

- A. Three (3) reinforced cores shall be taken from each test panel and sent to the Engineer to be visually graded. Each core shall be taken through a reinforcing member to verify the proper coverage around the reinforcement. The Engineer will visually grade reinforced specimens for conformance to specified core grade as specified in Subsection 2.03 – Shotcrete Core Grades.

Allow only nozzle operators with test panel mean core grade less than or equal to 2.5 to place job shotcrete. Nozzle operator shall shoot a second test panel if the first test panel is rejected. If nozzle operator's second mean core is greater than 2.5, that nozzle operator will not be permitted to shoot on the project.

- B. Three (3) unreinforced cores shall be taken from each test panel and tested for compressive strength to verify shotcrete mix design requirement. Compression testing shall be performed by an independent laboratory hired and paid for by the Contractor. Test results shall be submitted to the Engineer for review and approval. Testing shall be in accordance with ASTM C 1604/C 1609M.

Panels with cores meeting the compressive strength requirements and acceptable grades will be considered acceptance of the nozzleman.

2.02 CONSTRUCTION TESTING

Produce material test panel for each mix and each workday or every 50 cubic yards placed, whichever is less. Keep test panels moist and at 70 degrees F \pm 10 degrees F until moved to test laboratory. Obtain test specimens from job site material test panel. Test specimens from test panels in accordance with ASTM C 1140. Samples shall be cored and distributed for testing similar to pre-construction testing described in Subsections 2.01.A and 2.01.B.

The mean compressive strength of a set of three cores shall equal or exceed $0.85f'_c$ with no individual core less than $0.75 f'_c$.

2.03 SHOTCRETE CORE GRADE

A. Grade 1:

Shotcrete specimens are solid; there are no laminations, sandy areas or voids. Small air voids with maximum diameter of 1/8 inch and maximum length of 1/4 inch are normal and acceptable. Sand pockets or voids behind continuous reinforcing steel are unacceptable. The surface against the form or bond plane shall be sound, without sandy texture or voids.

B. Grade 2:

Shotcrete specimens shall have no more than two laminations or sandy areas with dimensions not to exceed 1/8 inch thick by 1 inch long. The height, width, and depth of voids shall not exceed 3/8 inch. Porous areas behind reinforcing steel shall not exceed 1/2 inch in any direction except along length of reinforcing steel. The surface against the form or bond plane shall be sound, without sandy texture or voids.

C. Grade 3:

Shotcrete specimens shall have no more than two laminations or sandy areas with dimensions exceeding 3/16 inch thick by 1-1/4 inches long, or one major void, sand pocket, or lamination containing loosely bonded sand not to exceed 5/8 inch thick and 1-1/4 inches in width. The surface against the form or bond plane may be sandy, with voids containing overspray to a depth of 1/16 inch.

D. Grade 4:

Core shall meet, in general, requirements of Grade 3 cores, but may have two major flaws such as described for Grade 3, or may have one flaw with maximum dimension of 1 inch perpendicular to the face of the core, with maximum width of 1-1/2 inches. The end of the core that was shot against the form may be sandy, with voids containing overspray to a depth of 1/8 inch.

E. Grade 5:

Core that does not meet criteria of core grades 1 through 4, by being of poorer quality, shall be classified as Grade 5.

F. Determine grade by computing the mean of a minimum of three test specimens. Accept mean grade of 2.5 or less. Reject individual shotcrete cores with grade greater

than 3.

- G. The above core grades are based on cores with surface area of 50 square inches. For cores with greater or lesser area than 50 square inches, adjust allowable flaws relative to 50 square inches.

2.04 EVALUATION OF IN-PLACE SHOTCRETE:

Remove and replace shotcrete that is delaminated, exhibits laminations, voids, or sand pockets exceeding limits for specified grade of shotcrete. Remove and replace shotcrete that does not comply with specified material properties. Repair core holes in accordance with ACI 301 Chapter 9. Do not fill holes by shooting.

2.05 ACCEPTANCE:

The Engineer will accept shotcrete work that meets requirements of the contract documents. The Engineer will accept shotcrete work that has previously failed to meet one or more requirements, but which has been repaired to meet requirements of the contract documents.

Shotcrete work that fails to meet one or more requirements and that cannot be brought into compliance will be evaluated for acceptance by the Engineer. Modifications and/or removal may be required to ensure remaining work complies with requirements of the contract documents. Modification, removal, and/or replacement of failed shotcrete work, as determined by the Engineer, shall be completed at the Contractor's expense at no additional cost to the State.

2.06 MATERIALS:

- A. Shotcrete.

Shotcrete mix shall have a 28 day compressive strength of at least 4,000 psi.

- B. Fiber Reinforcement.

Fiber reinforcement shall be 100 percent virgin polypropylene fibrillated fibers specifically manufactured for use as secondary concrete reinforcement, containing no reprocessed olefin materials. Fibers shall comply with ASTM C-1116, Standard Specification for Synthetic Fibers Reinforcement.

Fibers shall have a minimum specific gravity of 0.90 and a minimum tensile strength of 80 ksi. Fiber length shall be 2.25 inch.

Fiber reinforcement shall be added to the shotcrete at a minimum rate of 3.0 pounds

per cubic yard of shotcrete materials and mixed in strict accordance with the synthetic fiber reinforcement manufacturer's instructions and recommendations for uniform and complete dispersion.

C. Anchors.

Anchors shall be grouted and installed as shotcrete anchorage as shown on the plans and shall meet the requirements of Section 02268 – Grouted Anchors and Rock Dowels.

D. Reinforcing Steel.

Reinforcing steel shall be 6 x 6 – W2.9 x W2.9 (or heavier) hot-dipped galvanized welded wire fabric and as specified by the design documents.

Steel reinforcement shall be protected at all times from damage. All reinforcing steel shall be new, free from dirt, detrimental scale, paint, oil, or other foreign substances. Cleaning by sandblasting will not be allowed.

Reinforcement shall be accurately placed, supported, aligned, and secured against movement. Welded wire fabric shall not be in direct contact with the ground surface at any point. Concrete spacers shall be used where necessary to maintain spacing between the mesh and the slope surface as specified on the plans at no additional cost to the State. Rocks, twigs, and other objects used as spacers will not be accepted.

Splicing of wire mesh shall be made by lapping not less than two mesh squares and securely tied.

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

E. Fiber Reinforced Polymer (FRP) Reinforcing Dowels.

FRP bars may be made from glass or carbon fibers. Bars shall have a surface treatment that facilitates a bond between the finished bar and shotcrete.

Submit FRP material information to the Engineer for review and approval prior to installation.

F. Geocomposite Drain.

Submit product information to the Engineer for review/acceptance prior to installation.

1. Drain strip shall be a two part prefabricated soil drain consisting of a formed out polystyrene core on all sides with a non-woven, needle punched

polypropylene filter fabric.

Fabric Properties:

Material:	Polypropylene	
Grab Tensile:	110 lbs	per ASTM D4632
Puncture:	65 lbs	per ASTM D4833
Mullen Burst:	215 psi	per ASTM D3786
Elongation:	60%	per ASTM D4632
AOS Std.:	100 sieve	per ASTM D4751
Flow Rate:	150 gpm/sq ft	per ASTM D4491

Product Properties:

Flow Capacity per unit width:	21 gpm/ln ft	per ASTM D4716
Thickness:	1 inch	

-
2. Geocomposite drain strips shall be 12 inches wide and placed 4 feet center-to-center unless specified otherwise on the plans. Locations shall be as shown on the plans. If the Contractor needs to cut the drainage strips along the length to produce the desired width, all work must be in accordance with the manufacturer's approved written directions.
3. Geocomposite drain shall be suitably wrapped and protected from exposure to direct sunlight.
4. Geocomposite drains shall be placed in strips and connected in accordance with manufacturer's instructions to maintain continuity of flow channel through the drain. Splices shall overlap a minimum of 6 inches or as recommended by the manufacturer. Splice ends by peeling back the fabric and interlocking the dimpled core. Re-attach the fabric and cover with tape.
5. Geocomposite drains shall be installed to ensure that the drains are hydraulically connected from the top to bottom of the shotcrete. Connect universal tee outlets and weep holes where specified by the design documents, per manufacturer's instructions.
6. Geocomposite drains shall be attached to the surface by placing geotextile fabric directly against the slope surface. Drain strips shall be secured firmly against the slope surface per manufacturer's recommendations.
7. Should the geotextile cover fabric become damaged during installation by tearing or puncturing, the damaged section shall be completely cut out and replaced.

8. Geocomposite drains shall be protected from damage and deleterious contamination where drains must remain exposed until they are covered with embankment or backfill material.

PART 3 - EXECUTION

Use shotcrete only at locations indicated in the contract documents or ordered by the Engineer. Contractor shall request Engineer inspection of the shotcrete area for proper placement of reinforcing, drainage, etc. prior to shotcrete operations. Contractor shall notify the Engineer of this inspection at least three (3) days in advance of shotcreting. Contractor shall schedule the inspection to have ample time (a full working day at a minimum) to make corrective actions before the shotcrete operation if necessary.

Shotcrete work shall be performed in the presence of the Engineer. Any shotcrete placed without the Engineer present shall be rejected and replaced at the Contractor's expense.

3.01 PROPORTIONING, BATCHING, AND MIXING:

Batch the quantity of water as specified in mix design accepted by the Engineer for the process used. Proportion mortar ingredients, except water, either by volume or by weight. Batches requiring fractional sacks will not be allowed unless cement is weighed. Shotcrete mixtures shall be used within 90 minutes from initial batching unless the approved mix design validates a longer set time as described below. Otherwise, shotcrete placed using mixtures over 90 minutes old shall be rejected and replaced at the Contractor's expense. Shotcrete shall be in accordance with ASTM C94.

Admixtures may be added to the mix to improve set time and workability in which case the mix may be placed within a longer time frame than that specified above. However, the Contractor shall provide, with the initial mix submittal, written documentation and supporting data from the manufacturer verifying these attributes. Shotcrete operation, including shooting the pre-construction test panels, shall not begin until the mix design and all supplemental information is reviewed and approved by the Engineer.

If a wet mix is used, during the shotcrete operation the Contractor shall provide, at no additional cost to the State, an independent certified concrete testing laboratory hired by the Contractor to monitor properties of the concrete for quality control such as set time, slump, temperature, etc. The concrete inspector shall validate or reject concrete based on the applicable standards as determined by the independent lab. Contractor shall submit the inspector's pass/fail criteria to the Engineer for review and approval prior to shotcrete operation. All unacceptable shotcrete placed on the job shall be

removed and replaced at the Contractor's expense.

A. Dry-Mix Process.

Thoroughly mix cement and fine aggregate before charging into delivery equipment. Maintain moisture content of fine aggregate between 3 to 6 percent, such that fine aggregate-cement mixture flows at a uniform rate (without slugs) through delivery hose.

B. Wet-Mix Process.

Mix material at central mixing plant or at project site. If mixing is done at project site, use mixer capable of thoroughly mixing specified materials in sufficient quantity to maintain continuous shotcrete placement.

3.02 SHOTCRETE PROCESS - GENERAL:

Use either dry-mix or wet-mix shotcrete process as follows:

A. Dry-Mix Process.

1. Mix cement and fine aggregates thoroughly.
2. Feed cement-fine aggregate mixture into special mechanical feeder (gun) or other delivery equipment accepted by the Engineer.
3. Meter mixture into delivery hose by feed wheel or distributor.
4. Convey mixture by compressed air through delivery hose to special nozzle. Fit nozzle with perforated manifold capable of introducing water under pressure and thoroughly mixing water with other ingredients.
5. Jet mortar from nozzle at high velocity onto shotcrete-receiving surface.

B. Wet-Mix Process.

1. Mix ingredients thoroughly, as specified in Subsection 3.01-(A) – Dry-Mix Process, including water.
2. Introduce mortar into delivery equipment chamber.
3. Meter mortar into delivery hose and convey mortar to nozzle by compressed air or by other means.
4. Inject additional air at nozzle to increase velocity and improve gunning pattern.

5. Jet mortar from nozzle at high velocity onto the shotcrete-receiving surface.

3.03 EQUIPMENT:

Operate equipment in accordance with manufacturer's recommendations.

A. Dry-Mix Process.

Provide mixing equipment that will mix ingredients thoroughly and continuously.

Contractor shall provide measures to control dust pollution during mixing process.

Discharge fine aggregate-cement mixture into delivery hose in a manner that ensures delivery of a continuous, smooth stream of uniformly mixed material at proper velocity to discharge nozzle.

Equip discharge nozzle with manually operated water injection system (water ring) for directing even distribution of water through fine aggregate-cement mixture. Provide water valve capable of adjusting quantity of water delivered to nozzle. Locate water valve to enable nozzle operator to instantaneously adjust water volume as necessary during shotcrete application.

Deliver conical discharge stream of uniform appearance. If stream distortion or nonuniform appearance is noted, suspend shotcrete application until uniform shotcrete discharge is restored.

Use adequate supply of clean air to maintain required nozzle velocity and simultaneous blowpipe operation for removing rebound.

Supply water at uniform pressure of at least 15 pounds per square inch greater than operating air pressure at the nozzle. Use water booster pump to provide required pressure if line water pressure is inadequate.

B. Wet-Mix Process.

Provide wet-mix delivery equipment of design and size that has produced satisfactory results in similar work. Use wet-mix equipment that has adequate capacity to deliver pre-mixed materials accurately, uniformly, and continuously through delivery hose. Follow manufacturer's recommendations regarding:

1. Type and size of nozzle.
2. Cleaning equipment.

3. Inspecting equipment.
4. Maintaining equipment.

Provide air compressor capable of performing as specified in Subsection 3.03-(A) - Dry Mix Process and wet-mix equipment manufacturer's recommendations.

3.04 SURFACE PREPARATION:

Perform general clearing of the slope including the removal of vegetation within the shotcrete limits prior to applying shotcrete. This work shall be considered incidental to shotcrete installation.

- A. Subgrade. Dampen surface immediately before shooting with sufficient moisture to provide firm foundation and to prevent absorption of water from the mortar, but without free surface water.
- B. Concrete, Masonry, and Shotcrete. When bonding is required, remove all deteriorated, loose, unsound material, or contaminants that may inhibit bonding. Chip areas to be covered to remove offsets causing abrupt changes in thickness. Taper edges to eliminate square shoulders at perimeter of a cavity. Maintain surface saturated, surface-dry immediately before applying shotcrete.
- C. Steel. Remove loose mill scale, rust, oil, paint, or other contaminants. Prepare surface in accordance with SSPC-SP6.6. If high-pressure water blasting is used, remove all freestanding water before applying shotcrete.
- D. Rock. Remove loose material, mud, or other foreign material that will prevent bonding. Clean and pre-wet surface immediately before applying shotcrete.
- E. Forms. If forms are to be removed after use, apply form-releasing coating material on forms. Use coating material that does not alter shotcrete properties or interfere with bond of subsequent shotcrete layers. Secure forms to minimize effects of vibration. Construct forms to allow escape of placement air and rebound.

3.05 CREW QUALIFICATIONS:

Use nozzle operators with at least two years of experience in this type of work. Nozzle operator may be apprentice with at least six months of experience if supervised by foreman in charge with at least two years of nozzle operator experience. Shotcrete shall only be placed by certified nozzle operators approved for this project. Any shotcrete placed by a non-approved operator shall be rejected and replaced at the Contractor's expense.

3.06 ALIGNMENT CONTROL:

Provide joints, side forms, headers, and shooting strips for backing or paneling. Place in a manner that minimizes trapping of rebound. Install ground wires as guides to establish thicknesses, surface planes, and finish lines. Maintain wires taut and true to line at all times during shotcreting application.

3.07 GUNNING:

Place shotcrete first in corners, recesses, and other areas where rebound or overspray cannot escape easily. Place shotcrete with nozzle held approximately perpendicular to receiving surface. In corners, direct nozzle at approximately 45-degree angle or bisect corner angle. Construct ditch lining in non-sagging layers. Build up each layer by making several passes of the nozzle over specified surface. Apply shotcrete from nozzle in steady, uninterrupted flow. Should flow become intermittent, direct flow away from work area until steady, uninterrupted flow is restored.

Suspend gunning if high winds prevent nozzle operator from properly applying shotcrete or if rain washes out or causes shotcrete to slough.

3.08 REBOUND:

Remove rebound or overspray from previously prepared surfaces prior to shotcrete placement. Reuse of rebound or overspray will not be allowed.

3.09 CURING AND PROTECTION:

- A. All shotcrete shall be cured for a period of not less than seven (7) days by one of the methods listed below. During this curing period, the shotcrete shall be maintained with minimal moisture loss at a relatively constant temperature. Fresh shotcrete 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 shotcrete.

Curing shall immediately follow the finishing operation.

- B. Water Curing: If cured with water, shotcrete 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 one 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 shotcrete surfaces that are to receive paint finish, acid stain or resilient flooring, except those that are recommended by the manufacturer to be compatible with the applied finish. The Contractor shall submit to the Engineer a letter certifying that the curing compound is 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 terrazo grinder.
- E. Waterproof 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 shotcrete.

3.10 FINAL CLEANUP:

All work area, including surrounding vegetation, soil and rock surfaces, shall be clean and free of shotcrete or cement residue, wet or dry. All surplus earth resulting from construction shall be cleaned up and disposed. All debris resulting from work of this section shall be removed from the site at no additional cost to the State.

All equipment wash water shall be contained and disposed of offsite. No wash water shall be dumped on the site. No equipment shall be washed at the site without proper containment apparatus that is pre-approved by the Engineer.

PART 4 – MEASUREMENT AND PAYMENT

4.01 MEASUREMENT

Shotcrete installation shall be measured per cubic yard of shotcrete completely installed. All other costs of material, labor, equipment, and testing shall be considered incidental work and shall not be measured for payment.

4.02 PAYMENT

Shotcrete will be paid on a unit price basis per cubic yard of shotcrete installed in accordance to the contract documents.

END OF SECTION

SECTION 03362

SCULPTED SHOTCRETE FINISH

PART 1 - GENERAL

1.01 GENERAL REQUIREMENTS:

This section describes furnishing and constructing sculpted shotcrete finish. The Contractor shall construct the sculpted shotcrete finish as specified by the design plans or as directed by the Engineer, and supply all materials, equipment, and labor required for the sculpted shotcrete finishes as specified herein.

Sculpted shotcrete finish shall be applied to where specified in the drawings.

The surface shall be finished to produce a rock-like aesthetic finish to simulate the color and texture of the surrounding natural rock. Producing a rock-like aesthetic finish will require forming and carving relief into the shotcrete face to the limits shown on the plans. The relief shall be sculpted into shotcrete applied onto the structural shotcrete facing or onto a substrate suitable to sustain the sculpted shotcrete. The texture shall closely resemble that of the cuts within the local area adjacent to the project or approved mock-up.

1.02 PRE-QUALIFICATIONS OF SCULPTING SUBCONTRACTOR:

- A. The sculpting rock company shall provide a project reference list verifying the successful construction completion of at least five (5) permanent sculpted shotcrete projects during the past (2) years totaling at least 30,000 square feet of wall face shotcreted area. A brief description of each project with the Owner's name and current phone number shall be included.
- B. The sculpted rock company shall submit a list identifying the lead sculptor, additional sculptors and lead staining artisan to be used on the project each having experience installing sculpted shotcrete on at least (5) projects of similar magnitude and difficulty over the past (2) years. The list shall contain a summary of each individual's experience.
- C. Submit a resume for each proposed nozzle operator. Nozzle operators shall have at least two years of experience in this type of work. Nozzle operator may be apprentice with at least six months of experience if supervised by foreman in charge with at least two years of nozzle operator experience.

- D. Work may be suspended by the State if the Contractor uses non-approved sculpting personnel.

1.03 QUALITY ASSURANCE:

- A. Throughout the progress of installation of the Work of this Section, provide at least one person who shall be thoroughly familiar with the specified requirements, completely trained and experienced in the necessary skills, and who shall be continuously present at the site whenever work is in progress and shall direct work performed under this Section.
- B. In actual installation of the Work of this Section, use adequate numbers of skilled workmen to ensure installation in strict accordance with the approved design.
- C. In the case of conflict between referenced standards, the more stringent requirement shall govern.

1.04 SUBMITTALS:

- A. Shotcrete mix design, stain colors, paints and MSDS data sheets shall be submitted to the Engineer for review at least two weeks prior to the beginning of sculpted shotcrete construction. Shotcrete operations shall not commence without prior approval from the Engineer. Shotcrete installed before submittals are approved will be rejected and shall be replaced at the Contractor's expense.
- B. Contractor shall produce and submit preconstruction test panels as described in Subsection 1.05 – Test Panels. Test panels will be used to validate the competency of the sculpting company and the team selected for this project. No shotcrete work shall begin until the sculpted test panels have been reviewed and approved by the Engineer. Test panels that do not meet the requirements of this section shall be rejected and any additional testing required shall be at the Contractor's expense. Only sculptors who produce accepted test panels will be allowed to sculpt for this project.

1.05 TEST PANELS:

Test panels shall be produced in the presence of the Engineer. Contractor shall notify the Engineer at least three (3) days in advance of shooting and sculpting test panels. For each area of sculpted shotcrete finish, the Engineer will identify a nearby natural rock area to be used as a baseline for color, texture and finish for the sculpted shotcrete finish. Prepare one (1) preconstruction baseline test panel for each proposed finish, for each area. Make test panels at least 30 inches square with the same materials, construction, and the same thickness as design plans, but not more than 6 inches thick. Test panels shall be produced by the same personnel that will be performing the sculpting of job shotcrete. Test panels shall represent a small section of

the finished sculpted wall or floor finish and shall be used as a visual reference throughout the construction of the sculpted finish. Test Panels shall be received and approved by the Engineer before proceeding with the construction.

PART 2 - PRODUCTS

2.01 MATERIALS:

- A. Asbestos Prohibition: No asbestos containing materials shall be used 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.
- B. Shotcrete Mix Design: The Contractor must receive notification from the Engineer that the proposed mix design and method of placement are acceptable before shotcrete placement can begin. The recommended strength for shotcrete mix is 4,000 psi.
- C. Stain: The Contractor must receive notification from the Engineer that the proposed stain color is acceptable. The stains shall consist of a base and accent stain material. The base stain shall be an organic based non-toxic iron-oxide derivative that provides a spectrum of earth tones. The accent stain shall be hydrochloric acid with chromic, Cupric, Ferrous, Ferric, Manganese chloride stain with Sodium Dichromate.

PART 3 - EXECUTION

3.01 SCULPTING PROCESS:

- A. Sculpting shall only be performed by the pre-approved staff that produced the accepted test panels. Any sculpting done by unauthorized personnel shall be rejected and replaced at the Contractor's expense.
- B. Sculpting and carving of the nozzle applied shotcrete shall be carved and shaped in so that all crevasses shall be created with a slope so that water cannot be trapped or puddled on the wall face.
- C. Sculpting of shotcrete shall be carved in such a way in which finished work shall match an approximate look to that of the test panel.

3.02 SHOTCRETE CURING:

No curing compounds shall be used for sculpted shotcrete. Shotcrete shall be blanket or absorptive mat cured, kept continuously wet, for 7 days.

3.03 SHOTCRETE STAINING:

- A. All permanently exposed shotcrete surface shall be stained. Prior to staining, all permanently exposed shotcrete surfaces shall be cleaned and pressure washed with water to remove laitance and provide a clean surface. Sandblasting is not allowed.
- B. Application of stain shall be by low pressure sprayer, brush or roller. Shotcrete shall be cured a minimum of 24 hrs prior to staining. If staining is done within 7 days of shotcrete application blanket curing shall continue after application of staining for the remaining duration of the 7 day cure period.
- C. Shotcrete staining shall consist of applying a minimum of two separate applications of at least two multiple stain colors to all sculpted shotcrete (architectural surface treatment) such that the sculpted face demonstrates individual color variations and character to match that of the existing field variations and character to match that of the existing field conditions. Staining shall only be pre-formed when the entire sculpting is complete and not performed during sculpting construction. The test panel shall reflect the color variations and patterns of natural rock formations.
- D. Staining shall be performed on all portions of the finished surface once it is completed.
- E. The first coat shall consist of lighter earth tone. A second separate application of stain shall consist of darker accent stain to create darker tones and for highlighting.
- F. The accent stain shall be applied to replicate a close resemblance to the sculpted test panel. Caution shall be exercised to provide all necessary personal protection to the body during application. A copy of such printed material shall be furnished to the Engineer prior to application of the material. The stain material shall produce a spectrum of brown earth tone colors.
- G. Shotcrete and staining of the test panel shall be completed at no additional cost to the City.

3.04 FINAL CLEANUP:

All equipment wash water shall be contained and disposed of offsite. No wash water shall be dumped on the site. No equipment shall be washed on the park grounds without proper containment apparatus pre-approved by the Engineer.

PART 4 – MEASUREMENT AND PAYMENT

Sculpted Shotcrete Finish will not be measured for payment and shall be considered incidental to the shotcrete work as specified in Section 03361.

END OF SECTION

Sculpted Shotcrete Finish
03362-4