STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ADDENDUM NO. 1

FOR

**KUHIO HIGHWAY SLOPE STABILIZATION**
**VICINITY OF HANALEI BRIDGE**

**PROJECT NO. 560A-02-03**

**DISTRICT OF HANALEI**

**ISLAND OF KAUAI**

**2010**

Amend the Bid Documents as follows:

## A. SPECIAL PROVISIONS

1. Amend Notice to Bidders, last paragraph, page NB-1 dated 11/05/09 to read as follows:

"To be eligible for award, bidders must possess a valid State of Hawaii General Engineering Contractor's License "A" at the time of bidding."

2. Replace pages 105-1a thru 105-3a dated 01/23/06 with the attached pages 105-1a thru 105-3a dated r12/03/09.

3. Amend page 621-1a, line 12 to read as follows:

"**(1)** Checking and cleaning the portable traffic signal"

4. Replace pages 672-1a thru 672-11a dated 6/19/09 with the attached pages 672-1a thru 672-11a dated r12/03/09.

5. Replace pages 674-1a thru 674-3a dated 6/19/09 with the attached pages 674-1a thru 674-3a dated r12/03/09.

## B. PROPOSAL SCHEDULE

1. Replace pages P-6 to P-9 dated r11/1/09 with the attached pages P-6 to P-9 dated r12/03/09.

2. Replace Proposal Schedule pages P-10 and P-11 dated 10/20/09 with the attached Proposal Schedule pages P-10 and P-11 dated r12/03/09.

## C. PRE-BID MEETING

1. Pre-Bid Meeting Minutes and attendance sheet are attached for your information.

Please acknowledge receipt of this Addendum No. 1 by recording the date of its receipt in the space provided on page P-4 of the proposal.

BRENNON T. MORIOKA, Ph.D., P.E.
Director of Transportation

## SECTION 105 - CONTROL OF WORK

Make the following amendments to said Section:

(I) Amend **105.01 - Authority** to read as follows:

"**105.01 Authority.**

**(A) Authority of the Engineer.** The Engineer is the representative of the Director and has all the authority of the Director with respect to the contract. The Engineer will make decisions on all questions that may arise regarding the contract, such as, but not limited to:

**(1)** Interpretation of the contract documents.

**(2)** Acceptability of the materials furnished and work performed.

**(3)** Manner of performance and rate of progress of the work.

**(4)** Acceptable fulfillment of the contract on the part of the Contractor.

**(5)** Compensation under the contract.

The Engineer's decisions on questions, claims, and disputes will be final and conclusive subject to Subsection 107.15 – Disputes and Claims.

The Engineer may delegate specific authority to act for the Engineer to a specific person or persons. Such delegation of authority shall be established in writing and shall become effective upon delivery to the Contractor.

**(B) Authority of the Inspectors.** Inspectors, as a representative of the Engineer or other agencies, will inspect the work done and materials furnished. Such inspection may extend to the preparation, fabrication or manufacture of the materials to be used. The Inspector does not have authority vested in the Engineer unless specifically delegated in writing. The Inspector may not alter or waive the provisions of the contract, issue instructions contrary to the contract, or act as agent or representative of the Contractor.

Failure of an Inspector at any time to reject non-conforming work shall not be considered a waiver of the State's right to require work in strict conformity with the contract documents as a condition of final acceptance.

**(C) Authority of the Consultant and Construction Management.** The State may engage consultants and construction managements to perform duties in connection with the work. Unless otherwise specified in writing to the Contractor, such retained consultants and construction managements shall have no greater authority than an Inspector."

**(II)** Amend **Subsection 105.02 - Submittals** by revising the first paragraph from lines 52 to 61 to read as follows:

"**105.02 Submittals.** The contract contains the description of various items that the Contractor must submit to the Engineer for review and acceptance. The Contractor shall review all submittals for correctness, conformance with the requirements of the contract documents and completeness before submitting them to the Engineer. The submittal shall indicate the contract items and specifications subsections for which the submittal is provided. The submittal shall be legible and clearly indicate what portion of the submittal is being submitted for review. The Contractor shall provide six copies of the required submissions at the earliest possible date."

**(III)** Amend **Subsection 105.08 (A) - Furnishing Drawings and Special Provisions** to read as follows:

"**(A) Furnishing Drawings and Special Provisions.** The State will furnish the Contractor 12 sets of the project plans and special provisions. The project plans furnished will be the same size as that issued for bidding purposes except as noted in Section 648 – Field-Posted Drawings. The Contractor shall have and maintain at least one set of plans and specifications on the work site, at all times."

**(IV)** Amend **Subsection 105.14(D) - No Designated Storage Area** from lines 421 to 432 to read as follows:

"**(D) No Designated Storage Area.** If no storage area is designated within the contract documents, materials and equipment may be stored anywhere within the State highway right-of-way, provided such storage and access to and from such site, within the sole discretion of the Engineer, does not create a public or traffic hazard or an impediment to the movement of traffic."

**(V)** Amend **105.16(A) - Subcontract Requirements** by adding the following paragraph after line 483:

"The 'Specialty Items' of work for this project are as follows:

| **Section No.** | **Description** |
|---|---|
| 201 | Contract Item 201.1000 under Section 201 - Clearing and Grubbing |

| | |
|---|---|
| 203 | All Contract Items under Section 203 - Roadway Excavation |
| 209 | All Contract Items under Section 209 - Temporary Pollution, Dust, and Erosion Control |
| 607 | Contract Item 607.1000 - Chain Link Fence |
| 621 | Contract Item 621 - Temporary Traffic Signal System |
| 629 | All Contract Items under Section 629 - Pavement Markings |
| 641 | Contract Item 641.1000 - Hydro-Mulch Seeding |
| 643 | Contract Item 641 - Maintenance of Existing Landscape Areas |
| 645 | All Contract Items under Section 645 - Work Zone Traffic Control |
| 648 | Contract Item 648.1000 - Field Posted Drawings |
| 659 | All Contract Items under Section 659 - Erosion Control Matting" |

**(VI)** Amend **Subsection 105.16(B) - Substituting Subcontractors** by revising the second sentence from line 490 to line 493 to read:

"Contractors may enter into subcontracts only with subcontractors listed in the proposal or with non-listed joint contractors/subcontractors permitted under Subsection 102.06 - Preparation of Proposal."

**END OF SECTION 105**

Make this Section a part of the Standard Specifications:

## "SECTION 672 – ANCHORED WIRE MESH SYSTEM

**672.01 Description.** This section describes furnishing, transporting and constructing an anchored wire mesh system in accordance with the contract documents and the manufacturer's standards and requirements. The system shall be installed at the location(s) shown on the contract plans.

The anchored wire mesh system has been designed to withstand the static and dynamic forces generated from rocks or soil moving under the permanently installed system. The manufacturer shall be regularly engaged in the manufacturing of slope stabilization systems used in similar application and capacity. The manufacturer shall supply written evidence demonstrating certification of a quality assurance program. The manufacturer shall have a representative on site during the initial installation to ensure the correct and proper product installation and will remain on site until the Engineer is satisfied with the installation process.

**672.02 Materials.** All materials for the anchored wire mesh system shall conform to the following requirements. All exposed metal components shall be powder coated with black color.

**(A) High Strength Wire Mesh.** The high strength wire mesh shall be woven construction and shall be diamond shaped. The high strength wire mesh shall be made with 0.157-inch (4 mm) diameter wire, and the ends of each wire shall be fastened into a loop and twisted. The loops of the wire mesh shall be fastened together to prevent unraveling of the mesh. The wire shall be alloyed high strength carbon steel wire with a minimum tensile strength 256,000 psi (1,770 $N/mm^2$). The wire shall be galvanized with a 95% Zinc to 5% Aluminum coating with a minimum weight of 0.410 $oz/ft^2$ (125 $g/m^2$).

The size of the wire mesh opening shall be 3.25 inches by 5.6 inches (±5%) (83 mm by 143 mm) and the depth of the mesh shall be 0.59 inches.

**(B) Compression Claws (Press Claws).** The compression claws (also known as press claws) shall be 6-mm diameter carbon steel bar and hot dipped galvanized with a minimum layer thickness of 85 microns ($\mu$m). Standard (small) compression claws shall be used to fasten the meshes together and Special (large) compression claws shall be used to fasten the mesh to the boundary wire ropes.

**(C) Spike Plates.** The spike plates shall be made from 0.4 inch (10 mm) thick steel and shall be hot dipped galvanized with a minimum layer

thickness of 85 microns ($\mu$m). The spike plate shall be diamond shaped with a width of 7.5 inches (190 mm) and a length of 13 inches (330 mm).

**(D) Boundary Wire Ropes.** Boundary wire ropes shall have a diameter of .375 inches (9.525 mm) and shall be PVC coated, Jet Flat Black to bring the finished diameter to .5 inches (12mm). The rope shall be 6 by 19 construction (or equivalent), IWRC and galvanized with a minimum breaking strength of 23,940 pounds. The rope shall meet Federal Specification RR-W-410D or equivalent including galvanizing.

**(E) Drilled Holes.** Drill the holes for the grouted soil/rock anchors (including supplemental, short anchors and the anchors for the boundary wire ropes) in accordance with the minimum dimensions (diameter and depths) shown in the design drawings. The Contractor shall submit deviations from the dimensions shown on the design drawings for acceptance by the Engineer. The Engineer will not permit blasting for installation of the drilled holes. The Contractor shall submit to the Engineer for approval, a method statement describing drilling methods and procedures for grouting of the anchors in each of Area 1, 2, and 3 in detail. The Contractor shall demonstrate the proper technique to ensure the grouted soil/rock anchors to be installed in the specified inclination shown on the plans. The drilling equipment shall be securely mounted on a drilling platform, which is capable to suspend on the existing steep/vertical slope, to reduce disturbance to the slope. Drilling work for anchor installation shall not commence without an approval method statement. The Contractor shall be prepared to encounter both rock and/or soil when drilling and therefore the choice of drill and drilling method shall be appropriate to drill holes in both conditions. The Contractor is likely to encounter wet residual soils in Areas 1 and 2, and lower portions of Area 3. Thus, use of hand drilling equipment (plugers) is not recommended in these areas. Instead, the Contractor may need to use heavy equipment or other drilling techniques in order to achieve the required drilled depth and to secure integrity of the drilled holes.

Drilling and grouting at the same time shall not be allowed.

**(F) Grouted Soil/Rock Anchors.** The grouted soil/rock anchors shall consist of hollow core bolts meeting the following minimum specifications:

| | | |
|---|---|---|
| Outside Diameter | 1.25 inches | (32 mm) |
| Internal Diameter | 0.59 inches | (15 mm) |
| Effective Cross Sectional Area | 0.76 in$^2$ | (490 mm$^2$) |
| Ultimate Load Capacity | 81 kips | (360 kN) |
| Yield Load Capacity | 62 kips | (280 kN) |
| Weight per Foot | 2.85 lbs | (1.29 kg) |
| Corrosion Allowance (Zinc galvanization) | 157 mils | (4 mm) |

Zinc galvanization shall be included in the diameter (inside and outside) of the anchors. The length of the grouted soil/rock anchors shall be in accordance with the design drawings.

**(G) Supplemental (Short) Anchors.** Where required (not shown on the design drawings), supplemental anchors shall be installed, with the approval of the Engineer, in between the grouted soil/rock anchors shown on the design drawings. Supplemental anchors are installed to provide a neat appearance for the anchored wire mesh system only and serve no structural function. The supplemental anchors shall be grouted and meet the minimum specifications shown in subsection (F) above. The supplemental anchors shall have a corrosion allowance of 4 mm (157 mils) zinc galvanization included in their diameter (inside and outside). Where installed by the Contractor, the length of the supplemental anchors shall be at least 5 feet in length.

**(H) Grout.** The soil/rock anchors shall be grouted with non-shrink, non-metallic, non-gaseous grout with minimum compressive strength of 6,000 psi in 3 days. Water used for the grout shall be potable, clean and free of injurious quantities of substances known to be harmful to Portland Cement or the steel anchors.

**(I) Color Coating.** All exposed metal components of the anchored wire mesh system, such as the high strength steel wire mesh, compression claws, and spike plates shall have a powder coating of Jet Flat Black. The pigmented powder shall be applied using an electrostatic spray gun or equivalent process. The other exposed parts of the anchored wire mesh system that have not been powder coated shall have an applied coating of rubberized paint (color shall be black unless otherwise directed by the Engineer) for aesthetic purposes. Should shotcrete be used to fill depressions along the slope before anchored wire mesh installation, this shotcrete shall be dyed or coated with the color specified by the Engineer.

**(J) Miscellaneous Materials.** All miscellaneous materials associated with the anchored wire mesh system, such as wire rope clips, thimbles, etc., shall be supplied and appropriate for use with a PVC coated wire rope and shall be hot dipped galvanized. All such exposed metals shall have the same color coating provisions set in Section (I) above. Couplings for hollow core anchors shall be stainless steel by the anchor manufacturer.

## 672.03 Construction.

**(A) Pre-Construction Requirements.** The Contractor shall submit eight (8) copies of the layout and detailed drawings to the Engineer for

review and acceptance. The submittal shall be prepared by the manufacturer of the anchored wire mesh system. If required, the submittal shall also include samples of the materials with the powder coating and color(s) of the high strength wire mesh for selection and acceptance by the Engineer prior to placing an order for the anchored wire mesh system. The Engineer shall have 10 working days to review the submittal and provide written comments and acceptance of the submittal. Fabrication of the anchored wire mesh system shall not begin until the submittal has been reviewed and accepted by the Engineer. The cost for the manufacturer's assistance and drawings required in the submittal shall be included in the unit price cost of the anchored wire mesh system.

The Contractor shall submit an affidavit certifying that the high strength wire mesh meets the project specifications. The affidavit shall be signed by an official authorized to certify on behalf of the manufacturer and shall be accompanied by a mill certificate that verifies physical properties were tested during manufacturing and lists the manufacture's quality control testing.

The Contractor shall have a qualified and experienced representative from the high strength wire mesh manufacturer available during the initial placement and, if it is placed satisfactorily, on an as-needed basis during the construction. The representative shall visit the site for consultation at least once during construction.

In addition, the Contractor shall submit a layout plan showing the location of each proposed anchor on the plan, the rows and columns, and anchor numbers specific to each anchor. The anchor number system shall be in such a way with which each anchor could be located on the plan and on the project site. All anchor locations along the slope shall be marked and tagged using the specific anchor numbers corresponding to the layout plan. The anchor layout plan shall be submitted to the Engineer for review and approval. Drilling operations for anchor installation shall not begin without an approved anchor layout plan.

The Contractor shall be fully responsible for the safety of workers and representatives of the Engineer observing the installation and testing of grouted soil/rock anchors. The Contractor shall be responsible for providing grouted soil/rock anchors of the required load capacity, which adequately meet all anchor test acceptance criteria. Deficient grouted soil/rock anchors shall be replaced or additional grouted soil/rock anchors installed, as determined by the Engineer, at no additional cost to the State. In addition, other work required to install a replacement grouted soil/rock anchor shall be performed at no additional cost to the State.

The Contractor shall sign a statement that the Grouted Soil/Rock Anchor Contractor has inspected the project site and the subsurface information for the project. The Contractor shall demonstrate an

understanding of the subsurface conditions and all factors affecting the drilling and grouting operation.

The Contractor shall also acknowledge in the statement the construction access restriction including potential rockfall hazard from upper near vertical fractured basalt rock outcrop and narrow to no shoulder along the slope toe.

Calibration curves for jack, pressure gauge, and load cell used for anchor testing shall be submitted to the Engineer for review and approval.

**(B) Construction Requirements.** As part of the construction requirements, a technical representative from the manufacturer of the anchored wire mesh system shall be present on the site until the initial installation of the anchored wire mesh system is completed and deemed satisfactory by the Engineer at no additional cost to the State. All materials for the anchored wire mesh system shall be properly marked by the manufacturer in order for the Contractor to identify the components easily with the drawings to minimize installation time.

The anchored wire mesh system installation shall consist of the steps described below. Installation of the anchored wire mesh system shall follow the manufacturer's recommendations. Where discrepancies exist between the special provisions and the manufacturer's recommendations, the Contractor shall notify the Engineer immediately. The Engineer will provide directions to the Contractor on how to proceed with the work upon consultation with the manufacturer's technical representative to resolve the discrepancies.

All grouted soil/rock anchors shall be installed by the Contractor in the presence of the Engineer or his/her inspector, including drilling, grouting and testing. The inspector representing the Engineer for anchored wire mesh work shall be under supervision of a registered engineer licensed in the State of Hawaii who has experience in similar type of work.

In general, the following steps shall be followed during the installation of the anchored wire mesh system.

**(1)** Cut the slopes flat and remove trees, brush, debris and loose rocks in accordance with the contract documents. As directed by the Engineer, level slope surface of deep depressions (greater than 18 inches deep), not removed when clearing and cutting the slope by filling with shotcrete.

**(2)** Locate the grouted soil/rock anchors on the slope as shown on the design drawings and in accordance with the approval anchor layout plan developed by the Contractor. Prior to installation of the grouted soil/rock anchors, form dells of between 8 inches to 12 inches deep at each grouted soil/rock anchor location.

**(3)** Install the grouted soil/rock anchors in accordance with the design drawings and the approved anchor layout plan. The non-shrink grout shall be mixed per manufacturer's recommendation. The grouting operation shall commence no later than 24 hours after completion of drilling at each anchor location. The Contractor shall install supplemental anchors in shallow depressions (generally less than 18 inches deep) in order to pull the anchored wire mesh into the depressions and against the ground.

**(4)** Install the required grouted soil/rock anchors for the boundary ropes at the locations shown on the design drawings. The boundary ropes serve no structural purpose because the boundary ropes are used to pull the edge of the anchored wire mesh tight against the slope (for a neat appearance).

**(5)** Plant hydro-mulch seeding on face of the slope prior to placement of the erosion control matting.

**(6)** Lay the erosion control matting on the slope by unrolling down the slope in accordance with manufacturer's recommendations.

**(7)** Lay the high strength wire mesh on the slope by unrolling down the slope. The rolls can be shortened or lengthened as necessary by removing or adding sections, respectively. Overlap the mesh panels by a minimum of one mesh. Fasten the overlapped mesh panels with two (2) Type 1 compression claws (press claws) at each mesh.

**(8)** The compression claws (press claws) are installed with one claw directly above the loop and one directly below the loop. For obstructions, such as trees that are not removed, cut the wire mesh, bend the cut wire mesh pieces back, and secure in place with aluminum clamps (follow manufacturer's recommendations).

**(9)** Lay the high strength wire mesh on the slope by unrolling down the slope. The rolls can be shortened or lengthened as necessary by removing or adding sections, respectively. The horizontal connection (in line with the slope) of two mesh panels shall be made by fitting one (1) standard compression claw per individual mesh.

**(10)** For vertical mesh connection (along length of slope), overlap the mesh panels by a minimum of one mesh cell. Fasten the overlapped mesh panels with two (2) standard compression claws at each mesh cell. The compression claws are installed with one claw directly above the cell and one directly below the cell.

**(11)** Install the required boundary wire ropes and fasten the wire mesh to the boundary wire rope with special compression claws (minimum of one compression claw at every second mesh cell). Tighten the boundary ropes and pull tight against the slope ground.

**(12)** Place the spike plate onto the anchors. Using a hydraulic wrench, tighten the nuts and push the spike plates and wire mesh into the dells in order to tension the anchored wire mesh to at least 6.7 kips (30 kN). Torque the nuts to the values shown on the design drawings or in accordance with the manufacturer's recommendations.

**(C) Proof Testing of the Grouted Soil/Rock Anchors.** Perform proof testing on at least 5% of the grouted soil/rock anchors in the presence of the Engineer. The Contractor shall provide notification of testing schedule at least 48 working hours in advance to the Engineer. Anchors selected for proof testing shall be determined by the Engineer. All anchors with a lower grout volume than estimated shall be selected for proof testing. All anchors suspected of having defects (in the opinion of the Engineer) shall be selected for proof testing. A defective anchor shall be defined as one of the following.

**(1)** The minimum required drill hole diameter was not maintained (due to cave-in);

**(2)** The anchor length is less than the scheduled production anchor length, or less than the modified anchor length by the Engineer;

**(3)** The estimated grout volume is significantly (10% or greater) less than the theoretical grout volume (calculated using drill bit diameter and length of the drill hole). The actual grout volume may be estimated using average grout volume per stroke of grout pumping, or a calibrated grout flow meter, or other means proposed by the Contractor and accepted by the Engineer. The grout flow meter shall be maintained in working condition throughout the entire construction duration, with regular cleaning for each working day shift and weekly field verification to check the measurement accuracy.

The defective grout soil/grout anchors selected for proof testing shall not be included as part of the minimum 5% required for proof testing. The cost for the anchor proof testing of the defective anchors shall be borne by the Contractor. Do not perform the proof testing until the grout for the anchor has cured for at least 72 hours and attained at least the specified 3-day compressive strength of the grout. Testing prior to 72 hours will only be allowed if the Contractor submits compressive strength test results verifying that the anchor grout mixes being used will provide the specified 3-day compressive strengths at the specified earlier time desired for the anchor testing.

Testing equipment shall include dial gauges, dial gauge support, jack and pressure gauge, electronic load cell, and a reaction frame. Provide a description of the test setup and jack, pressure gauge, and load cell calibration curves for review and approval by the Engineer. The reaction frame shall provide sufficient clearance away from the test anchor and beyond the conical grouted soil/rock anchor pull-out influence zone. Measure the anchor head movement with a dial gauge capable of measuring with a precision of 0.001 inch. The dial gauge shall have sufficient travel length to allow the test to be done without having to reset the gauge. Visually align the gauge parallel with the axis of the anchor and support the gauge independently from the jack or reaction frame.

The pressure gauge shall be capable of measuring up to 100 psi for each jack and shall be calibrated as a unit with the cylinder extension in the approximate position that it will be when it achieves the final jacking force, and shall be accompanied by a certified calibration chart. The gauge shall have been calibrated within one-year prior to use on the project. All calibration instruments shall be certified and identified using a unique and non-removable label provided by the company or manufacturer performing the calibration tests.

Upon request from the Engineer, the Contractor shall provide the calibration certification for any testing equipment being used by the Contractor. The certification shall be provided by the Manufacturer or Manufacturer's official representative. Additional calibration after load testing shall be provided if requested by the Engineer, at no additional cost to the State.

Proof test shall be performed by incrementally loading the anchor to a maximum test load of 150 percent of the design pullout capacity indicated on the design drawings. The anchor head movement at each load shall be measured and recorded by the Contractor. The test load shall be monitored by a load cell or a jack pressure gauge with a precision of 100 psi. At load increments other than the maximum test load, the load shall be held long enough to obtain a stable reading. Incremental loading for proof tests shall be in accordance with the following load schedule. The anchor head movements shall be recorded at each load increment.

## PROOF TEST LOADING SCHEDULE

| LOAD | HOLD TIME |
|---|---|
| AL (0.05-DL maximum) | Until Stable* |
| 0.25 DL | Until Stable* |
| 0.50 DL | Until Stable* |
| 0.75 DL | Until Stable* |
| 1.00 DL | Until Stable* |
| 1.25 DL | Until Stable* |
| 1.50 DL | 10 minutes (<0.04" measured between 1 and 10 minutes reading), otherwise 60 minutes |

* Until Stable = per ASTM standards the anchor testing movement <0.01 inches per hour.

The alignment load (AL) shall be the minimum load required to align the testing apparatus and shall not exceed 5 percent of the Design Load (DL). The DL is the design pullout capacity indicated on the design drawings. Dial gauges shall be set to "zero" after the alignment load has been applied.

All load increments shall be maintained within 5 percent of the intended load. Depending on performance, either 10 minutes or 60 minutes creep tests shall be performed at the maximum test load (1.50 DL). The creep period shall start as soon as the maximum test load is applied and the anchor movement shall be measured and recorded at 1 minute, 2, 3, 5, 6, and 10 minutes. Where the anchor movement between the 1 minute and 10 minute readings exceeds 0.04 inches, the maximum test load shall be maintained an additional 50 minutes and movements shall be recorded at 20, 30, 50, and 60 minutes.

A test anchor will be considered acceptable by the Engineer when all of the following requirements are met:

**(1)** A total creep movement of less than 0.04 inch is measured between the 1 and 10 minutes readings or a total creep movement of less than 0.08 inch is measured between the 6 and 60 minutes readings and the creep rate is linear or decreasing throughout the creep test load hold period.

**(2)** A pullout failure does not occur at or prior to the maximum test load. Pullout failure is defined when attempts to further increase the test load simply result in continued pullout movement of the test anchor. The load where the pullout failure occurs shall be recorded as part of the test data.

Successful proof tested anchors meeting the above test acceptance criteria may be incorporated as production anchors, provided that the specified corrosion protection is provided.

If a test anchor does not satisfy the acceptance criterion, the Contractor shall determine the cause and submit the modification to the Engineer for acceptance and approval.

The Engineer may require the Contractor to replace some or all test anchors that do not satisfy the acceptance criteria. Some or all replacement anchors may require proof testing. Installation and testing of the replacement anchors will be at no additional cost to the State.

**(D) Anchor Installation Records.** Records documenting the grouted soil/rock anchor construction will be maintained by the Contractor, unless specified otherwise. During drilling operation for anchor holes, the Contractor shall document drilling data for each bore hole including but not limited to, variations in soil and rock conditions, depth of soil and rock depth, to weathered or hard rock, and any other variations in the ground condition such as presence of cavities and lava tubes. The Contractor shall also document the grouting operation including grout volume used, and any unusual conditions such as loss of grout for each anchor hole. The Contractor shall provide the Engineer with as-built drawings showing as-built grouted soil/rock anchor locations within 5 days after completion of the grouted soil/rock anchor installation and testing. Submit all test data with as-builts.

**672.04 Measurement.**

**(A)** The Engineer will measure anchored wire mesh system per square foot in accordance with the contract documents, in place and operational.

**(B)** As required by the Engineer, leveling slope surface by shotcreting deep depressions (greater than 18 inches deep) will be measured on a force account basis in accordance with Subsection 109.06 – Force Account Provisions and Compensation.

**(C)** As required by the Engineer, additional grouted soil/rock anchor work will be measured on a force account basis in accordance with Subsection 109.06 – Force Account Provisions and Compensation.

**672.05 Payment.** The Engineer will pay for the accepted pay items listed below at the contract price per pay unit, as shown in the proposal schedule.

Payment will be full compensation for the work prescribed in this section and the contract documents. Pay unit includes full compensation for furnishing shop drawings, labor, materials, equipment, tools, pullout testing, and incidentals

necessary to complete the anchored wire mesh system at the locations shown on the drawings.

The Engineer will pay for the following pay item when included in proposal schedule:

| Pay Item | Pay Unit |
|---|---|
| Anchored Wire Mesh System | Square Foot |
| Additional Grouted Soil/Rock Anchor Work | Force Account |
| Leveling Slope Surface | Force Account |

An estimated amount for the force account may be allocated in the proposal schedule under "Additional Grouted Soil/Rock Anchor Work." The Engineer will pay for additional grouted soil/rock anchor beyond the anchor length shown on the plans, which is required to extend during construction by the Engineer at an agreed upon unit price per linear foot.

The Engineer will consider the clearing of vegetation and removal of trees for the installation of the anchored wire mesh system as a separate pay item. The Engineer will pay for this work under Section 201 – Clearing and Grubbing."

**END SECTION 672**

Make this Section a part of the Standard Specifications:

## "SECTION 674 – ROCK DEMOLITION AND REMOVAL

### 674.01 Description.

This section describes methods and materials used to demolish and remove rocks and/or boulders indicated on the plans. The Contractor shall furnish materials, labor, and equipment necessary to demolish, secure locally, and/or dispose portions of rock to the limits determined in the field by the Engineer with stationing and/or coordinates. The expansive stress method or mechanical rock splitters or jacks for rock demolition shall be used. Other demolition methods proposed by the Contractor shall be subject to written acceptance by the Engineer. The Engineer at his discretion may deem it necessary to have the Contractor remove demolished boulders from the project site at no additional cost to the State and will direct the Contractor during rock demolition operations. During rock demolition, the contactor shall provide for the safe conduct of the work, careful removal, securing of, and the disposition of material to be removed, protection of property that is to remain undisturbed, and coordination with other work involved.

Explosives shall not be used for rock removal work.

### 674.02 Materials.

Chemical component for the expansive stress mixture shall be "BRI-STAR" expansive stress demolition agent, or equal. Water required for the mixture shall be clean potable water. Quantity, method, and mixture ratio shall be as recommended by the manufacturer for the type, size, and temperature of the rock to be removed.

BRI-STAR powder comes in anti-moisture bags and shall be stored off the floor or ground on pallets or other elevated areas in a dry location. Bags shall be used as soon as possible and should only be unpacked right before planned use. Opened bags shall be re-sealed or placed in an airtight container, as moisture absorption will impact mixture's effectiveness. Broken bags received in shipping shall not be used.

BRI-STAR mixture shall only be prepared 10 minutes prior to use since once mixed with the water, the mixture gradually loses it fluidity and will become difficult to pour beyond this time. BRI-STAR mixture should not be left in a container beyond 10 minutes as "blown-out" shots may occur. BRI-STAR mixture that has lost its fluidity shall not be reused and shall be properly disposed of as recommended by the manufacturer.

## 674.03 Construction Requirements.

**(A) Rock Demolition and Removal.** Rockfall areas shall be cleared and secured prior to the start of any rock removal work. Contractor shall provide temporary means of protection against accidental runaway rocks during demolition, including temporary impact fences and local protection by means of steel cable nets. Such temporary means shall be at no additional cost to the State. In the areas that a permanent mesh drape system is to be installed, all specified or required rock demolition shall be accomplished prior to installation of the mesh. No rock demolition shall be performed where the permanent mesh has been installed. Upon verification by the Engineer in the field as to the specific location and the limits of rock to be removed, the Contractor shall drill holes using a jackhammer, leg hammer or other approved method necessary to accept the BRI-STAR mixture. Drilling method, hold diameter, length, angle, and spacing shall be as recommended by the manufacturer for the type and size of rock to be removed. Polyethylene sacks or sleeves may be used to line the hole where numerous fractures or large voids are present that could allow mixture to leak from the hole and allow water to enter into the hole. BRI-STAR mixture shall be poured into the hole to the top. Entire rock shall be covered with a plastic sheet to avoid any accidents caused by "blown-out" shots. After initial cracking, secondary breaking may be required using a hand-breaker, pick-hammer, hydraulic breaker, ripper, etc. that will allow for controlled removal of the rock to the determined limits.

The Contractor may use hydraulic rock splitters or jacks at their discretion to demolish boulders.

**(B) Disposal of Rock Material.** All demolished rock material shall become the property of the Contractor and properly disposed of off-site in accordance with all Federal, State and County requirements. The Contractor shall make all necessary arrangements to obtain any required permits for the use of off-site disposal locations.

**(C) Protection of Existing Facilities.** Existing structures, utilities, and other items of properties to remain shall be protected from damage during rock removal. 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.

**(D) Certificate of Compliance.** Rock removal shall be performed using BRI-STAR expansive stress demolition, hydraulic rock splitters, or other mechanical methods. The Contractor, upon submission of a bid, shall ensure that they are familiar with the method of demolition proposed

and can perform rock removal work per manufacturer's recommendation and standard industry practice in a safe and efficient manner. The Contractor shall be responsible and liable for any damages to life and property, including structures, utilities, etc. as a result of rock demolition and removal operations.

**(E) Depressions.** Deep depressions (greater than 18 Inches deep) created during rock demolition shall be filled with shotcrete and/or the rock overhang above the depression cutback as directed by the Engineer, at no additional cost to the State.

**(F) Critical Support Boulder.** The Contractor shall immediately notify the Engineer should he/she assess the rock to be demolished provides critical support to the boulders above. As directed by the Engineer, the Contractor shall install rock bolts to secure the boulder in place in lieu of rock removal. Rock bolts shall be paid by force account under Pay Item No. 672.1100

**674.04 Measurement.** Rock demolition and removal, including proper disposal of demolished rock material will be paid on a lump sum basis in accordance with contract documents. Measurement for payment will not apply.

**674.05 Payment.** The Engineer will pay for the rock demolition and removal, including disposal of demolished rock material at the contract unit price per pay unit, as shown in the proposal schedule. Payment will be full compensation for work prescribed in this section and contract documents.

The Engineer will make payment under:

| **Pay Item** | **Pay Unit** |
|---|---|
| Rock Demolition and Removal | Lump Sum" |

**END SECTION 674**

# PREFERENCES

Bidders agree that preferences shall be taken into consideration to determine the low bidder in accordance with said Sections and the rules promulgated, however, the award of contract will be in the amount of the bid offered exclusive of any preferences.

## A. HAWAII PRODUCTS PREFERENCE

It is understood that certain Hawaii Products may be acceptable for use in this project and that, pursuant to Sections 103D-1002, HRS, which provides preference for Hawaii Products, a bidder proposing to use such Hawaii products shall so designate in the schedule provided below.

Persons desiring to qualify product(s) not currently on the list, shall complete form SPO-38, *Certification for Hawaii Product Preference* in accordance with the Supplemental Special Provisions of these specifications.

If a bidder proposes to use Hawaii Products, the bidder must so designate in said schedule by entering the cost of such product in the appropriate space provided. Failure on the part of the bidder to designate the use of Hawaii products will automatically void any preference for that product.

It is understood by the bidder that if the bidder elects to furnish qualified Hawaii Products, and is awarded the contract, then fails to use such products or meet the requirements of such preference, the bidder shall be subject to the statutory penalties, provided in Section 103D-1002, Hawaii Revised Statute, and such other remedies as may be available to the State.

## DESIGNATION OF APPROVED HAWAII PRODUCTS* TO BE USED
### *CONSTRUCTION PRODUCTS AND SOIL AMENDMENTS/PRODUCTS

| Product Category | Product Subcategory as applicable | Manufacturer | Cost FOB Jobsite, Unloaded Including Applicable General Excise & Use Taxes (a) | 10% (b) | Credit (a) x (b) |
|---|---|---|---|---|---|
| Aggregates – Basaltic Termite Barrier | | | $ | | $ |
| Aggregates and Sand – Basalt, Rock, Cinder, Limestone and Coral | | CTS Earthmoving, Inc. | $ | | $ |
| | | Grace Pacific (Oahu2) | $ | | $ |
| | | Hawaiian Cement | $ | | $ |
| | | Tileco, Inc. | $ | | $ |
| | | West Hawaii Concrete | $ | | $ |
| | | Yamada and Sons, Inc. | $ | | $ |
| Aggregates – Recycled Asphalt and Concrete | | Grace Pacific (Oahu2) | $ | | $ |
| Asphalt and Paving Materials | | Grace Pacific Corporation (Hawaii) (Oahu) (Kauai) | $ | | $ |
| | | Maui Paving LLC | $ | | $ |
| | | Walker-Moody Pavement Products & Equipment | $ | | $ |
| | | Yamada and Sons, Inc. dba YS Rocak and Con-Agg of Hawaii | $ | | $ |
| Coatings – Cementatious Waterproofing | | | $ | | $ |
| Cement and Concrete Products | | Hawaiian Cement | $ | | $ |
| | | Tileco, Inc. | $ | | $ |
| | | West Hawaii Concrete | $ | | $ |
| Precast Concrete Products | | | $ | | $ |

| | | | | | |
|---|---|---|---|---|---|
| Environmental Sewage - Treatment Innovative System (ESIS) | | Environmental Waste Management Systems, Inc. | $ | | $ |
| | Septic Tanks | Walker Industries, Ltd. | $ | | $ |
| Hot Dip Galvanizing | | | $ | | $ |
| Insulation – Expanded Polystyrene Products | | | $ | | $ |
| Grouts and Adhesives – Ceramic Tile | | | $ | | $ |
| Metal Roofing and Flashing – Preformed | | | $ | | $ |
| Pipes – Aluminum and Galvanized | | | $ | | $ |
| Signs – Traffic, Regulatory & Construction | | Safety Systems Hawaii, Inc. | $ | | $ |
| Soil Amendments, Mulch, Compost | | Kauai Nursery & Landscaping, Inc. | $ | | $ |
| | | Sanford's Service Center, Inc. | $ | | $ |
| Windows and Doors – Rigid Vinyl Framed | | | $ | | $ |
| Wood – Furniture, Casework and Millwork (natural wood finish) | | | $ | | $ |
| | | | | TOTAL | $ |

## B. RECYCLED PRODUCT PREFERENCE

Recycled product preference shall not apply to this proposal.

# PROPOSAL SCHEDULE

| ITEM NO. | ITEM DESCRIPTION | APPROX. QUANTITY | UNIT | UNIT PRICE | AMOUNT |
|---|---|---|---|---|---|
| 201.1000 | Clearing and Grubbing | L.S. | L.S. | L.S. | $ _____ |
| 203.1000 | Roadway Excavation | 250 | CU. YD. | $ _____ | $ _____ |
| 203.2000 | Borrow Excavated Material | 4,500 | CU. YD. | $ _____ | $ _____ |
| 209.1000 | Installation, Maintenance, Monitoring, and Removal of BMP | L.S. | L.S. | L.S. | $ _____ |
| 209.2000 | Additional Water Pollution, Dust, and Erosion Control | F.A. | F.A. | F.A. | $ 20,000.00 |
| 607.1000 | Chain Link Fence | L.S. | L.S. | L.S. | $ _____ |
| 621.1000 | Temporary Traffic Signal System | F.A. | F.A. | F.A. | $ 120,000.00 |
| 629.1000 | 8-Inch Pavement Striping (Tape, Type III or Thermoplastic Extrusion) | L.S. | L.S. | L.S. | $ _____ |
| 629.2000 | Double 4-Inch Pavement Striping (Tape, Type III or Thermoplastic Extrusion) | L.S. | L.S. | L.S. | $ _____ |
| 629.4000 | Type C Raised Pavement Marker | L.S. | L.S. | L.S. | $ _____ |
| 629.5000 | Type D Raised Pavement Marker | L.S. | L.S. | L.S. | $ _____ |
| 641.1000 | Hydro-Mulch Seeding | L.S. | L.S. | L.S. | $ _____ |
| 643.1000 | Maintenance of Existing Landscape Areas | F.A. | F.A. | F.A. | $ 10,000.00 |
| 645.1000 | Traffic Control | L.S. | L.S. | L.S. | $ _____ |
| 645.2000 | Additional Police Officers, Additional Traffic Control Devices, and Advertisement | F.A. | F.A. | F.A. | $ 100,000.00 |

# PROPOSAL SCHEDULE

| ITEM NO. | ITEM DESCRIPTION | APPROX. QUANTITY | UNIT | UNIT PRICE | AMOUNT |
|---|---|---|---|---|---|
| 648.1000 | Field Posted Drawings | L.S. | L.S. | L.S. | $ _____ |
| 659.1000 | Erosion Control Mat - Permanent | 51,400 | SQ. FT. | $ _____ | $ _____ |
| 659.1100 | Erosion Control Mat - Temporary | 6,300 | SQ. FT. | $ _____ | $ _____ |
| 671.1000 | Rock Slope Scaling | L.S. | L.S. | L.S. | $ _____ |
| 672.1000 | Anchored Wire Mesh System | 51,400 | SQ. FT. | $ _____ | $ _____ |
| 672.1100 | Additional Grouted Soil/Rock Anchor Work | F.A. | F.A. | F.A. | $ 180,000.00 |
| 672.1200 | Leveling Slope Surface | F.A. | F.A. | F.A. | $ 60,000.00 |
| 673.1000 | Ring Net System | 4,000 | SQ. FT. | $ _____ | $ _____ |
| 674.1000 | Rock Demolition and Removal | L.S. | L.S. | L.S. | $ _____ |
| 675.1000 | Rock Bolts for Securing Boulders | F.A. | F.A. | F.A. | $ 80,000.00 |
| 699.1000 | Mobilization (Not to Exceed 10% of the Sum of All Items Excluding the Bid Price of This Item and Force Account Items.) | L.S. | L.S. | L.S. | $ _____ |
| | SUM OF ALL ITEMS | | | | $ _____ |

NOTE: Bidders must complete all unit prices and amounts. Failure to do so may be ground for rejection of bid.

KUHIO HIGHWAY SLOPE STABILIZATION
VICINITY OF HANALEI BRIDGE
PROJECT NO.: 560A-02-03

PRE-BID MEETING MINUTES
DECEMBER 2, 200, 9:00 A.M.

Pre-bid began at 9:22 AM.
Opened pre-bid conference by stating that the license required for this project is a valid State of Hawaii General Engineering Contractor's "A" license and that this conference would field questions about the project.

1. Question: Can working days be extended?
   Response: No, the working days cannot be extended.

2. Question: If additional Police officers/flaggers are required for the project, how will it be paid?
   Answer: Two Police Officers is already a requirement for the project. Should additional Police Officers/flaggers be requested by the Engineer, this additional item shall be paid for under 645.2000 - Additional Police Officers, Additional Traffic Control Devices, and Advertisement.

3. Question: Is there surface leveling required prior to mesh installation and how will it be paid?
   Answer: We will amend Section 672 and Proposal Schedule to include a Pay Item in the Proposal Schedule in Addendum No. 1.

4. Question: Are demolished materials to become Contractor's property?
   Answer: We will amend Section 674 in Addendum No. 1.

Pre-bid Conference concluded at 10:40 AM.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
DESIGN BRANCH
HIGHWAY DESIGN SECTION
601 KAMOKILA BOULEVARD, ROOM 609
KAPOLEI, HAWAII 96707-2023

# PRE-BID CONFERENCE

601 KAMOKILA BOULEVARD, CONFERENCE ROOM 611
KAPOLEI, HAWAII 96707-2023
02 DECEMBER 2009 0900 HOURS

**PROJECT:** KUHIO HIGHWAY SLOPE STABILIZATION
VICINITY OF HANALEI BRIDGE

**PROJECT NUMBER:** 560A-02-03

| PRINT NAME | TITLE | OFFICE | TELEPHONE NO. |
|---|---|---|---|
| 1. MANNY QUODALA | PROJECT ENGINEER | HDOT / HWY-DD | 692-7573 |
| 2. Randy Hamamoto | Project Manager | AECOM | 529-7244 |
| 3. Aronson Nikou | Engineer | AECOM | 529-7233 |
| 4. Clif Tilton | Project Manager | Granite Const. | 864-6428 |
| 5. | | | |
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