STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ADDENDUM NO. 2

for

ALA MOANA BOULEVARD ELEVATED PEDESTRIAN WALKWAY
ISLAND OF OAHU
FEDERAL AID PROJECT NO. BLD-092-1(029)

The following amendments shall be made to the Bid Documents:

A. SPECIAL PROVISIONS

i. Replace Table of Contents dated r07/13/21 with the attached Table of Contents dated r09/10/21.

ii. Replace Special Provision Section 202 dated r07/13/21 with the attached Special Provision Section 202 dated r9/10/21.

iii. Replace Special Provision Section 511 dated r07/13/21 with the attached Special Provision Section 511 dated r9/10/21.

iv. Replace Federal Wage Rates dated 07/16/2021 with the attached Federal Wage Rates dated 09/10/2021

B. PROPOSAL SCHEDULE

i. Replace Proposal Schedule pages P-8 through P-23 dated r08/30/21 with the attached revised Proposal Schedule pages P-8 to P-23 dated r09/10/21.

C. PLANS

i. Replace Plan Sheets Nos. 28, 29, 39, 53, 54, 56, 57, 58, 59, 81, 85, 93, 94, 96, 97, 110, 117, 122, 123, ADD. 124, 125, 132, 133, 143, 146, ADD. 147, ADD. 148, 150, 151, ADD. 152, ADD. 153, 155, 156, ADD. 158, 160, ADD. 161, ADD. 162, 164, ADD. 167, 169, ADD. 170, 177, 178, 179, 180, 181, 182, 183, ADD. 186, 209, 211, 212, 213, and ADD. 225 with the attached revised Plan Sheet Nos. ADD. 28; ADD. 29, ADD. 39, ADD. 53, ADD. 54, ADD. 56, ADD. 57, ADD. 58, ADD. 59, ADD. 81, ADD. 85, ADD. 93, ADD. 94, ADD. 96, ADD. 97, ADD. 110, ADD. 117, ADD. 122, ADD. 123, ADD. 124, ADD. 125, ADD. 132, ADD. 133, ADD. 143, ADD.146, ADD.147, ADD.148, ADD. 150, ADD. 151, ADD. 152, ADD. 153, ADD. 155, ADD. 156, ADD. 158, ADD. 160, ADD. 161, ADD. 162, ADD. 164, ADD. 167, ADD. 169, ADD. 170, ADD. 177, ADD. 178, ADD. 179, ADD. 180, ADD. 181, ADD. 182, ADD. 183, ADD. 186, ADD. 209, ADD. 211, ADD. 212, ADD. 213 and ADD. 225

ii. Add the attached Plan Sheets No. ADD. 85S-1, ADD. 85S-2, ADD. 85S-3 and ADD. 85S-4.

The following is provided for information:

D. ANSWERS TO QUESTIONS FROM PROSPECTIVE BIDDERS

i. Attached are requests for information and responses for your information.

E. SUBSTITUTIONS

i. SELUX #MST-R3W-1-5G350-27-16-BK-277 / AT535-14-BK-BC5-SSAB316 is approved as a substitute for pedestrian walkway pole light standard provided the following conditions are met.
    1. Light standard shall conform to the new design requirements for State Highway and Pedestrian Walkway Standards indicated on plan sheet E-15 of the contract drawings. Design shall be in accordance with AASHTO Load and Resistance Factor Design (LRFD) Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 1st Edition (2015) including all subsequent interim revisions and editions.
    2. Manufacturer to provide certification that light standard meets Code of Federal Regulations Section 635.410 – Buy America Requirements.
    3. All nuts, washers, bolts, and anchor bolts shall be stainless steel.

4. Provision for future private security camera mounting will not void warranty of substitute light pole and luminaire.
5. Any modifications to the structural foundation details currently indicated on the contract drawings to accommodate the substitute light pole and luminaire will be provided at no additional cost to the State.
6. Changes to wiring size and quantity due to the substitute light pole and luminaire will be provided at no additional cost to the State.
7. Pole base can fit all proposed underground conduits as indicated on plans.
8. Light fixture is compatible for use with GE LightGrid smart node for purpose of controlling luminaire.

ii. Lithonia RADPT-P1-27K-ASY-MVOLT-RADPT20-DBLXD and Lithonia RTAH-13'8"-5C-T20-TP-CPL34/12'-DBL-USPOM are approved as a substitute for pedestrian walkway pole light standard provided the following conditions are met.
    1. Light standard shall conform to the new design requirements for State Highway and Pedestrian Walkway Standards indicated on plan sheet E-15 of the contract drawings. Design shall be in accordance with AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 1st Edition (2015) including all subsequent interim revisions and editions.
    2. Manufacturer to provide certification that light standard meets Code of Federal Regulations Section 635.410 – Buy America Requirements.
    3. All nuts, washers, bolts, and anchor bolts shall be stainless steel.
    4. Provision for future private security camera mounting will not void warranty of substitute light pole and luminaire.
    5. Any modifications to the structural foundation details currently indicated on the contract drawings to accommodate the substitute light pole and luminaire will be provided at no additional cost to the State.
    6. Changes to wiring size and quantity due to the substitute light pole and luminaire will be provided at no additional cost to the State.
    7. Pole base can fit all proposed underground conduits as indicated on plans.
    8. Light fixture is compatible for use with GE LightGrid smart node for purpose of controlling luminaire.

iii. SPRING CITY #ALMLCH-M-LE120-EVX-2F2-40-CN5-YSLF-LACLB-TR7P-ANON/CW is denied as a substitute for the decorative Type "B" luminaire due to maintenance issues.

iv. SPRING CITY #AARNRT-1S-72-32-TN2.38-6.25-ANON/CW #ASH6S-T18-10.00-29.00-TN3.00-5.00-ANON/CW #AWBMIA-24-ANON/CW #SWBWSH-26-GV/CW is approved as a substitute for decorative Type “B” highway light pole (single arm) provided the following conditions are met.

1. Light pole shall conform to the new design requirements for State Highway and Pedestrian Walkway Standards indicated on plan sheet E-15 of the contract drawings. Design shall be in accordance with AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 1st Edition (2015) including all subsequent interim revisions and editions.
2. All nuts, washers, bolts, and anchor bolts shall be stainless steel.
3. Any modifications to the structural foundation details currently indicated on the contract drawings to accommodate the substitute light pole will be provided at no additional cost to the State.
4. Pole base can fit all proposed underground conduits as indicated on plans.

v. SPRING CITY #AARNRT-2S-72-32-TN2.38-6.25-ANON/CW #ASH6S-T18-10.00-29.00-TN3.00-5.00-ANON/CW #AWBMIA-24-ANON/CW #SWBWSH-26-GV/CW is approved as a substitute for decorative Type “B” highway light pole (dual arms) provided the following conditions are met.

1. Light pole shall conform to the new design requirements for State Highway and Pedestrian Walkway Standards indicated on plan sheet E-15 of the contract drawings. Design shall be in accordance with AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 1st Edition (2015) including all subsequent interim revisions and editions.
2. All nuts, washers, bolts, and anchor bolts shall be stainless steel.
3. Any modifications to the structural foundation details currently indicated on the contract drawings to accommodate the substitute light pole will be provided at no additional cost to the State.
4. Pole base can fit all proposed underground conduits as indicated on plans.

Please acknowledge receipt of this Addendum No. 2 by recording the date of its receipt in the space provided on page P-4 of the Proposal.

JADE T. BUTAY
Director of Transportation

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SECTION 202 – REMOVAL OF STRUCTURES AND OBSTRUCTIONS

Make the following amendments to said Section:

(I) Amend **202.03(A) Removal of Obstructions** by revising lines 34 to 37 to read as follows:

> "Remove HMA pavements that are not to remain in place. Removal includes rooting, plowing, pulverizing, or scarifying to a minimum depth of 6 inches or to bottom of the underlying base, whichever is greater. Place earth cover of not less than 6 inches in thickness. Submit Earth Cover Plan."

(II) Amend **202.04 – Measurement** by revising lines 119 to 120 to read as follows:

"**202.04 Measurement.** The Engineer will measure removal of structures and obstructions, if ordered by the Engineer, on a force account basis, in accordance with Subsection 109.06 – Force Account Provisions and Compensation."

(III) Amend **202.05 – Payment** by revising lines 122 to 131 to read as follows:

"**202.05 Payment.** The Engineer will pay for the accepted removal of structures and obstructions including potholing to locate the obstructions, excavation to remove the grade beams, pile caps and piles, removal of a portion of the grade beams, pile caps and piles that are in conflict with the new work elements, disposing the concrete and soil (if needed), lining the excavation with geotextile fabric, and backfilling the resulting excavation with an approved backfill material 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.

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

Pay Item	**Pay Unit**
Removal of _____	Force Account

An estimated amount for the force account may be allocated in the proposal schedule under "Removal of Existing Grade Beams and Piles", but the actual amount to be paid will be the sum shown on the accepted force account records when directed by the Engineer, whether this sum be more or less than the estimated amount allocated in the proposal schedule.

The Engineer will not pay for requested submittals. The Engineer will not consider claims for additional compensation of late submittals or request by Contractor."

END OF SECTION 202

Amend Section 511 – Drilled Shafts to read as follows:

"SECTION 511 - DRILLED SHAFTS

511.01 Description. This section is for installing drilled shafts according to the contract. Drilled shafts include reinforced or unreinforced concrete with or without concrete bell footings.

511.02 Materials. Materials shall conform to the following:

(A) Portland Cement Concrete. Concrete shall conform to Section 601 - Structural Concrete and Section 511 – Drilled Shafts.

The in-place concrete shall have minimum 28-day compressive strength f'_C = 5000 pounds per square inch and maximum water to cementitious material ratio of 0.45. The in-place concrete density shall not be less than 3 pounds per cubic foot below the theoretical mix design density.

Proportion the concrete mix designs to get properties of high workability, compaction under self-weight, resistance to segregation, and resistance to excessive bleeding. The maximum nominal aggregate size shall be 0.75 inch. The slump range shall be 7.0 inches $\pm$ 1.0 inch for concrete poured into a water free borehole and 8.0 inches $\pm$ 1.0 inch for concrete placed under water or under drilling slurry. Slump for the concrete shall be a minimum of four inches after four hours from initial mixing.

The Engineer will permit superplasticizers.

At the time of placement, the concrete temperature shall not exceed 85°F.

The final concrete mix design shall be based on field trial batches to determine the most suitable materials and proportions that will provide a concrete mixture having the least amount of segregation and bleeding, and at the same time provide the necessary workability to meet placing requirements.

(B) Reinforcing Steel. Reinforcing steel shall conform to Section 602 - Reinforcing Steel.

(C) Casings. Casings shall have inside diameters not less than the required diameter of the shafts and wall thicknesses specified or adequate to withstand construction loads and stresses.

(D) Cement Grout. Cement grout used for setting the expandable load cells and for filling the access tubes after completion of crosshole sonic logging tests and cored holes, shall be prepackaged, non-shrink, non-metallic, and non-gaseous grout with the same strength as the drilled shaft concrete. The grout shall contain 10 grams of water-based migrating amine carboxylate corrosion inhibitor per 0.5 cubic feet.

(E) Crosshole Sonic Logging (CSL) Test Access Tube. Access tubes shall be at least 2-inch inside diameter, Standard steel pipe conforming to ASTM A53, Grade B, Type E.

Access tubes shall have round, regular inside diameter, free of defects and obstructions, including all pipe joints, in order to permit free unobstructed passage of 1.375-inch maximum diameter source and receiver probes used for crosshole sonic logging testing. Access tubes shall be watertight, free from corrosion, with clean internal and external faces to ensure good bonding between the drilled shaft concrete and access tubes. Fit access tubes with watertight caps on bottom and top. Both ends of the access tube shall be capped at all times except when being connected to another access tube. The end of the tubes shall be undamaged and suitably prepared for the end caps and coupling system adopted. Access tube coupling shall be used when extension of the access tubes is necessary. The access tube coupling shall be watertight.

When crosshole sonic logging testing is indicated in the contract documents, submit manufacturer's certificate of compliance for the acceptance of the access tubes.

511.03 Construction.

(A) Qualifications of Drilled Shaft Contractor. Be capable of installing drilled shafts, conducting load tests and other related work as specified in the contract and shall have the following minimum experience requirements below.

(1) Drilled Shaft Experience. Because of the expertise required to successfully complete the drilled shafts according to the contract, a qualified drilled shaft Contractor shall install the drilled shaft. The drilled shaft Contractor shall have installed at least three projects completed in the last five years on which the Contractor has installed a minimum of five drilled shafts per project of a diameter and length similar to those shown in the contract. Include in list of projects, names and phone numbers of owner's representatives who can verify the drilled shaft Contractor's participation on those projects. Drilled shaft Contractor shall have on its payroll and on the project for the entire duration, supervisory

personnel who have participated in drilled shaft construction, similar to the type proposed in the contract, for duration of at least three years within the last 10 years.

(B) Preconstruction Requirements.

(1) Experience Information. Submit the following information to the Engineer within 30 days after award of contract for acceptance by the Engineer:

(a) List of drilled shaft projects completed in the past 10 years. The list of projects shall contain the names and phone numbers of owner's representatives who can verify participation on that project.

(b) Name and experience record of the drilled shaft superintendent who will be in charge of drilled shaft operations for this project. Drilled shaft superintendent shall have minimum three years experience within the last 10 years in drilled shaft construction similar to type proposed. Drilled shaft superintendent shall remain on the project for the duration of the drilled shaft work. Drilled shaft superintendent who leaves the project shall be replaced with personnel with equal or better experience. Submit proposed superintendent's name and experience record for acceptance.

(C) Protection of Existing Structures. Prevent damage to existing structures and utilities. Preventive measures shall include:

(1) Selecting construction methods and procedures that will prevent caving of the shaft excavation, and

(2) Monitoring and controlling the vibrations from construction activities such as the driving of casing or sheeting or drilling of the shaft.

(D) Installation Plan. At least 30 days before constructing the drilled shafts, submit an installation plan for acceptance by the Engineer. This plan shall at a minimum provide information on the following:

(1) List of proposed equipment such as cranes, drills, augers, bailing buckets, final cleaning equipment, concrete pumps, and casing,

(2) Details of construction operation sequence and the sequence of shaft construction at abutment and center pier locations,

(3) Details of shaft excavation methods including how the excavated material from the drilled shaft will be controlled on site and removed; and method of setting and extracting casing,

(4) Details of methods to ensure shaft stability, including prevention of caving or bottom heave using casings or other means accepted by the Engineer. If casings are to be used, submit dimensions and detailed installation and dewatering procedures for temporary casings; and removal procedures for temporary casing,

(5) If the Contractor plans to use slurry, details of the methods to mix, circulate and desand slurry,

(6) Details of methods to clean the shaft excavation,

(7) Details of reinforcement placement including lifting, support, and centralization methods,

(8) Details of concrete placement including proposed operational procedures for pumping method,

(9) Details of attaching the crosshole sonic logging test access tubes to the reinforcing cage, details of testing access tubes for leakage after cage installation and prior to shaft concrete placement, and details for grout placement in the crosshole sonic logging test access tubes after testing is completed,

(10) Details of required load test, including equipment, procedures, and calibrations within 6 months prior to installation for jacks or load cells supplied by the Contractor,

(11) Proposed concrete mix design, including expected strengths at 3,7, and 28 days. Submit test results of both a trial mix and a slump loss test, conducted by State-accepted testing laboratory using methods specified in Section 601 - Structural Concrete. Tests shall demonstrate that concrete meets 4-hour plasticity requirement at expected ground ambient temperature and at highest expected ambient air temperature (two separate slump loss tests required), and

(12) Test results from laboratory measurements of the ultrasonic pulse velocity, performed in accordance with ASTM C 597, on 3-

day, 7-day, and 28-day concrete trial mix samples described in Subsection 511.03(D)(11).

The Engineer will evaluate the drilled shaft installation plan for conformance with the contract documents. Within 30 days after receipt of the plan, the Engineer will notify the Contractor of additional information required including if applicable, changes necessary to meet the contract requirements. The Engineer will reject parts of the installation plan that are unacceptable. The Contractor shall resubmit changes for re-evaluation within 15 days. The Engineer will have another 30 days to review all resubmittals. Procedural acceptance given by the Engineer shall be subject to trial in the field. The acceptance shall not relieve the Contractor of the responsibility to complete the work according to the contract.

(E) Drilled Shaft Load Test. Load test shall be performed at the location shown on the plans and be completed before construction of any production drilled shafts. This work includes all labor, materials, equipment and services necessary for conducting the bi-directional axial load test and reporting the results, including the following: (a) the number of bi-directional expandable load cells as indicated on the plans, (b) materials to construct a stable reference system(s) for monitoring vertical and horizontal deflection of the drilled shaft during testing, supported a minimum distance of the reference system, (c) materials sufficient to construct and protect the work area, load test equipment, and personnel from inclement weather and sunlight, and illuminate area as needed, (d) electric power as required and suitable for lights, welding, instruments, etc., and (e) suitable optical survey equipment to measure the horizontal and vertical displacement of the shaft during testing independent of the reference beam(s) and electronic equipment.

(1) Experience Requirements. The Contractor shall obtain the services of an experienced specialty Subcontractor with a minimum of three years of bi-directional load testing experience accepted by the Engineer to direct the assembly and instrumentation of the load cells, and to record all data and furnish results of the test to the Engineer.

(2) Materials. Materials for the drilled shaft load test shall conform to the requirements of Section 511.02 - Materials.

(3) Load Test Instrumentation. Provide instrumentation consisting of vibrating wire embedment strain gauges connected to a central data collection terminal; expandable load cell with readout device, and/or other equipment specified or indicated to measure movement of the top and bottom plates of the load cell, top of the test shaft, and strain at indicated locations within the shaft.

The embedment strain gauges shall be positioned along the test shaft at intervals shown on the Plans. The embedment strain gauges shall be attached securely to prevent movement from the installed location. The Engineer may require relocation of the embedment strain gauges and load cell based on the submittals provided by the Contractor. Each embedment strain gauge shall be capable of measuring strain to the nearest 0.0001 inch/inch and shall be capable of measuring or compensating for temperature. All embedment strain gauges shall have been calibrated or certified as accurate prior to installation. Take precautions not to damage the embedment strain gauges.

Load cell shall be a flat, hydraulically expandable load cell of a minimum of 20 inches in diameter and capable of applying a load test of at least 1,500 kips in each direction. The load cell shall be accurate to within 1%, shall expand uniformly, and shall be capable of being installed as described herein. The load cell shall have provisions for monitoring displacements of the upper and lower plates to an accuracy of 0.001 inch. The load cell shall have been calibrated or certified as accurate to within 1% of the true loads not more than six months prior to installation.

CSL test access tubes shall be installed in the load test shaft as shown on the contract to allow performance of CSL tests. Installation of the CSL tubes shall be in accordance with Subsection 511.03(L) – Crosshole Sonic Logging (CSL) Test Access Tubes and shall be incidental to the load test shaft work.

(4) Construction Requirement. The drilled shaft load test shall be a bi-directional load test utilizing a hydraulically expanded load cell. The bi-directional load test separately tests the shear resistance and end-bearing of the drilled shaft by loading the shaft in two directions (upward-shear resistance, downward-end bearing and shear resistance), using hydraulically expanded load cell, or by loading the shaft using other accepted methods capable of full separation of the shear bearing components. The drilled shaft used for the load test program shall be instrumented, as specified in this Section, by an experienced specialty Subcontractor accepted by the Engineer. Load test shaft with excessive lateral extension (more than 12 inches) of the shaft diameter will be rejected, unless accepted by the Engineer. Rejected load test shaft shall be replaced at no additional cost to the State.

The Contractor shall supply equipment required to install the load cell, conduct the load test, and remove the load test apparatus

as required. For the drilled shaft load test, the following set up procedure shall be used:

(a) The load cell, piping and other attachments will be assembled and made ready for installation under the direction of the specialty Subcontractor, in a suitable area, adjacent to the load test shaft, to be provided by the Contractor. The load cell assembly shall be placed at the location shown on the plans in conjunction with the construction of the reinforcing cage. The Engineer reserves the right to adjust the location of the load cell prior to installation.

(b) Drill load test shaft to the maximum depth shown on the plans.

(c) Clean the bottom of the shaft excavation after drilling is complete.

(d) Caliper testing shall be performed on the load test shaft to obtain profile shape data to be used to verify the shaft verticality and diameter. A minimum of eight data points around the circumference of the load test shaft shall be obtained at every one foot increment throughout the depth of the load test shaft. Caliper testing may be performed using a sonar-type caliper.

(e) Install the rebar cage assembly and load cell under the direction of the specialty Subcontractor and in the presence of the Engineer. The Contractor shall use the utmost care in handling the rebar cage/test equipment assembly so as not to damage the instrumentation during installation.

(e) After the installation of the rebar cage/test equipment assembly, the drilled shaft shall be concreted in the same manner as specified for production shafts.

(g) After completion of concrete placement and prior to load testing, CSL testing shall be performed in accordance with Subsection 511.03(L) – Crosshole Sonic Logging (CSL) Test Access Tubes.

(5) Load Test Schedule. The Contractor shall notify the Engineer of the load testing schedule a minimum of fifteen calendar days prior to the commencement of load testing.

(6) Load Test Procedures. The load test shall be completed and the load test data evaluated by the Engineer for revision to the production shaft length before construction of any production shafts. The Engineer shall have at least 20 calendar days after submission of the load test report to review the load test result prior to providing the production shaft lengths. Load testing on the shaft shall not begin until the concrete has attained a compressive strength of 5,000 psi and aged for seven days.

Load the load test shaft using the quick load test method of ASTM D1143 except as modified herein. Apply the test load in increments of 150 kips, as directed by the Engineer. A load-deflection curve shall be plotted as the test progresses to avoid missing information near the failure load or to correct the precise load increments.

The load test shall be conducted to the maximum test load of 2,400 kips or plastic failure, whichever occurs first. Plastic failure is defined as the load corresponding to mobilization of side shear or end bearing and no further increase in load can be obtained.

The load test shall be held for a minimum of 4 hours at the 1,200-kip, 1,800-kip, and 2,400-kip load intervals to evaluate the creep effects, or at a load as directed by the Engineer.

(7) Cleanup. After completion of the load test and CSL testing, and at the direction of the Engineer, the Contractor shall remove all equipment, waste and other material that is not a part of the finished structure. The load cell remaining in the shafts shall then be grouted through the piping provided as a part of the load cell assembly.

After completing the load test, cut off the load test shafts at an elevation 24 inches below the finished ground surface. The portion of the shafts cut off and removed shall remain the property of the Contractor.

(8) Replacement. Load test shaft found inadequate because of improper or failure of instrumentation, testing or construction procedures shall be replaced and retested, at no additional cost to the State.

(9) Reporting. Report the test results as specified in ASTM D1143 including, but not limited to, the following:

(a) Introduction;

(b) Drilled shaft installation procedure;

(c) Load test procedure and instrumentation; and

(d) Appendix which shall include report of calibration of instruments, plan view location of the load test and test boring related to the Project, records of subsurface exploration, records of load test shaft installation, tabular and graphical presentation of the load-deflection data of end-bearing and side shear from the load test.

(F) Construction Requirements. This subsection shall be applicable to trial, test and production drilled shafts unless otherwise directed by the Engineer.

(1) Construction Sequence. The Contractor shall complete the excavation to footing elevations before shaft construction begins unless accepted in writing by the Engineer. Drilling of shafts within a horizontal distance of 3.0 times the shaft diameter to the hole being drilled shall not commence until a minimum of 24 hours after the drilled shaft has been completed by placement of concrete to the top of shaft elevation in order to avoid interaction effects between adjacent shafts.

Repair the disturbances caused by shaft installation to the footing area before pouring the footing.

(2) Construction Methods. Excavate for shafts to the dimensions and elevations shown in the contract. Its methods and equipment shall be suitable for the intended purpose and materials met. Use the permanent casing method only when required by the contract or authorized by the Engineer. Blasting shall not be permitted.

(a) Dry Construction Method. The dry method includes drilling the shaft excavation, removing accumulated water and loose material from the excavation, and placing the reinforcing cage and shaft concrete in a dry excavation. Use this method only at sites where the groundwater table and soil conditions are suitable to permit construction of the shaft in a dry excavation. The Engineer will inspect the sides and bottom of the shaft visually before placing the concrete. Dry excavation is defined as an excavation where maximum depth of water does not exceed 3 inches.

(b) Wet Construction Method. This method includes using water, mineral, or polymer slurry to maintain stability of the hole perimeter while advancing the excavation to final depth, placing the reinforcing cage, and concreting the shaft. Use this method at sites where a dry excavation for placement of the shaft concrete cannot be maintained.

Reuse drilling water only if permitted by the Engineer and contingent upon control of unit weight to no more than 62.5 pounds per cubic foot and Marsh funnel viscosity to not more than 27 seconds per quart, at the time drilling water is introduced into the borehole.

When locating drilled shafts in open water areas, extend the exterior casings from above the water elevation into the ground. Install the exterior casing to produce a positive seal at the bottom of the casing so that no intrusion or extrusion of water or other materials occurs into or from the shaft excavation.

(c) Casing Construction Method. The temporary casing method may be used at sites where the dry or wet construction methods are inadequate. Use permanent casing method only when required by the contract documents or authorized by Engineer. The casing may be placed either in a predrilled hole or advanced through the ground by twisting, driving, or vibration before cleaning the casing.

(G) Excavation.

(1) General. Make the shaft excavations at locations, and to shaft geometry and dimensions shown in the contract. After acceptance by the Engineer, adjust drilled shaft tip elevations when the material met during excavation is unsuitable and/or differs from that anticipated in the design of the drilled shaft.

Maintain a construction method log during shaft excavation. Submit method log within 24 hours of shaft drilling completion. The log shall contain information such as:

(a) Excavation diameters;

(b) Equipment used;

(c) Type of material excavated with the elevations of the material;

(d) Rate of excavation including time drilling started, when different material is encountered, tool changes, finish of shaft excavation, and difficulties encountered;

(e) The description of and approximate top and bottom elevation of each soil or rock material encountered.

(f) Elevation and approximate rate of any seepage or groundwater; and

(g) Remarks, including temporary stoppages.

Any drilled shaft concrete over the theoretical amount required to fill any excavations for the shafts dimensioned on the plans shall be furnished at no additional cost.

Dispose the excavated material according to Section 203 - Excavation and Embankment.

Furnish drilled shaft concrete required to fill excavations for shafts dimensioned in the contract documents.

Do not permit workers to enter the shaft excavation unless:

(a) A suitable casing is in place.

(b) The water level is lowered and stabilized below the level the workers will occupy, and

(c) Adequate safety equipment and procedures are provided, performed and in place.

(2) Excavation and Drilling Equipment. The excavation and drilling equipment shall have adequate capacity including power, torque, and down thrust to excavate a hole to the maximum diameter and to a depth of ten feet or 20% beyond the depths shown in the contract, whichever is greater.

The excavation and overreaming tools shall be of adequate design, size, and strength to do the work shown in the contract.

(a) Special Drilling Equipment. When conventional earth augers and/or underreaming tools cannot be used for

drilling, provide special drilling equipment including rock core barrels, rock tools, air tools and other equipment as necessary to construct the shaft excavation to the size and depth required.

The use of special drilling equipment and/or procedures will be necessary to drill through the cobbles and boulders, and the basalt rock formation. The Contractor shall anticipate encountering an abundance of boulders of various sizes in deposits classified as "fill", "alluvium", and "residual soil" on the boring logs and shall make allowance for difficult drilling in his bid. In addition, the Contractor shall make allowance for difficult drilling in his bid within the basalt rock formation. The cost for the use of special drilling equipment and procedures necessary to drill through the cobbles and boulders, and basalt rock formation shall be incidental to unclassified shaft excavation. The Engineer will not permit blasting.

(b) Sidewall Overreaming. When the sidewall of the hole has softened, swelled, or degraded, sidewall overreaming will be required by the Engineer. Overreaming thickness shall be a minimum of 0.5 inch and a maximum of 3.0 inches. The Contractor may overream with a grooving tool or overreaming bucket. The thickness and elevation of sidewall overreaming shall be according to the contract or as directed by the Engineer. Overream sidewall and place additional shaft concrete at no cost to the State.

(3) Unclassified Excavation. When the contract designates drilled shaft excavation as unclassified, provide the necessary equipment to remove and dispose of materials met in forming the drilled shaft excavation, including installation of temporary casing and/or use of slurry, as necessary. The Engineer will not make separate payment for excavation of materials of different densities and character (hardness) or employment of special tools and procedures necessary to excavate the drilled shaft. The Engineer will pay for obstruction removal separately.

(4) Obstructions Removal. Remove obstructions at drilled shafts locations when authorized by the Engineer. Obstructions shall include man-made materials such as but not limited to old concrete foundations not shown on the Plans.

The Contractor shall employ special procedures and/or tools after the Contractor cannot advance the hole using conventional augers fitted with soil or rock teeth, drilling buckets and/or underreaming tools. Such special procedures/tools may include

chisels, boulder breakers, core barrels, air tools, hand excavation, temporary casing, and increasing the hole diameter.

Drilling tools and any other equipment, lost in excavation, are not considered obstructions. Remove the drilling tools and any other equipment promptly. The cost due to tools lost in the excavation shall be at no additional cost to the State including costs associated with hole degradation (requiring overreaming or other methods) due to removal operations or the time the hole remains open or any other remedial actions needed to be performed to correct the situation caused by the tool lost.

Natural materials used as fill materials or present within lagoonal deposits and coralline materials such as cobbles and boulders shall be anticipated at the site during excavation and shall not be considered an obstruction regardless of the size and hardness of the boulder. These natural materials used as fill materials shall not be considered an obstruction under this section.

(H) Casings.

(1) General. Casings shall be steel, smooth, watertight, and of ample strength to withstand both handling and driving stresses and the pressure of concrete and the surrounding earth materials. The inside diameter of the casing shall not be less than the specified size of the shaft. The Engineer will not allow extra compensation for concrete required to fill the oversized casing or oversized excavation. Remove casings from shaft excavations except when the casing is permanent.

(2) Temporary Casing. The Engineer will consider subsurface casing temporary unless shown in the contract as permanent casing. Remove the temporary casing before completing the placing of concrete in the drilled shaft. The Contractor may require telescoping, predrilling with slurry, and/or overreaming to beyond the outside diameter of the casing to install casing.

When choosing to remove a casing and substituting a longer or larger diameter casing through caving soils, stabilize the excavation with slurry or backfill before installing the new casing.

Before withdrawing the casing, the level of fresh concrete in the casing shall be the higher of the following:

(a) Minimum of five feet above the hydrostatic water level, or

(b) Level of drilling fluid, outside the casing.

While withdrawing the casing, maintain an adequate level of concrete within the casing to:

(a) Displace the fluid trapped behind the casing upward, and

(b) Discharge the fluid at the ground surface without contaminating or displacing the shaft concrete.

When temporary casings become bound or fouled during shaft construction and cannot be removed, the Engineer will consider the drill shaft defective. Improve such defective shafts according to the contract or submit remedial repair for acceptance by the Engineer. Such improvement may consist of removing the shaft concrete and extending the shaft deeper, providing straddle shafts to compensate for capacity loss, or providing a replacement shaft. Do corrective measures including redesign of footings caused by defective shafts according to the contract at no cost to the State or extension of the contract time. Any redesign of the footing shall be submitted to the Engineer for acceptance. The redesign shall be performed by a structural engineer and a civil engineer specializing in the geotechnical practice both licensed in the State of Hawaii. All remedial repairs shall have drawings and calculations signed and stamped by both of the above licensed engineers. The Engineer will not pay for the casing remaining in place as well as any redesign or remedial repair.

(l) Slurry. If required, use only polymer or mineral slurries in the drilling process. The polymer slurry shall have sufficient viscosity and gel characteristics to transport excavated material to suitable screening system. The mineral slurry shall have a mineral grain size that will remain in suspension and sufficient viscosity and gel characteristics to transport excavated material to suitable screening system. The percentage and specific gravity shall be sufficient to maintain the stability of the excavation and to allow proper concrete placement.

During construction, maintain the level of the slurry at a height sufficient to prevent caving of the hole. When a sudden significant loss of slurry occurs, delay the construction of that foundation until an alternate construction procedure is submitted for acceptance by the Engineer.

Premix the polymer or mineral slurry thoroughly with clean fresh water in slurry tanks and adequate time (as prescribed by the manufacturer) allotted for dehydration before introducing the slurry into the shaft excavation by pumping. The slurry tanks shall have capacity for adequate slurry circulation, storage, and treatment. Excavated slurry pits in lieu of slurry tanks will not be allowed without the written permission of the Engineer.

Use desanding equipment to control slurry sand content to less than 4% by volume in the borehole for mineral slurry and less than 0.5% by volume for polymer slurry. The Engineer will not require desanding equipment for setting temporary casing, sign post, or lighting mast foundations.

Prevent the slurry from "setting up" in the shaft, such as: agitation, circulation and/or adjusting the properties of the slurry. Dispose of slurry in suitable areas off from the project site.

The Contractor shall have the representative from the manufacturer of the slurry product on site providing the technical support for the slurry preparation, placement, testing and other quality control. Carry out the control tests using suitable apparatus on the polymer or mineral slurry to resolve the density, viscosity, pH, and sand content. An acceptable range of values for those physical properties for mineral slurry is in Table 511-1 – Mineral Slurry in Fresh Water. Acceptable range of values for those physical properties for two types of polymer slurries is in Table 511-2 - Shore Pac GCV (CETCO Drilling Products Group) In Fresh Water and Table 511-3 - SLURRYPRO CDP (KB Technologies Ltd.) In Fresh Water.

Test the density, viscosity, and pH value during the shafts excavation to establish a consistent working pattern. Make a minimum of four sets of tests during the first 8 hours of slurry use. When the results show consistent behavior, decrease the testing frequency to one set every four hours of slurry use.

TABLE 511-1 - MINERAL SLURRY IN FRESH WATER

Property	Range of Values *		Test Method
	Time of Slurry Introduction	In Hole At Time Of Concreting	
Density (pcf)	64.3**- 69.1**	64.3**-75.0**	Density Balance
Viscosity (sec/qt)	28 - 45	28 – 45	Marsh Cone

PH	8.0 – 11.0	8.0 – 11.0	pH paper pH meter

* At 20 ^{0} C
** Increase by two pounds per cubic foot in salt water

Notes: a. When the Contractor does not need to control the bottom hole conditions or when tests show that other criteria are appropriate, the Engineer may modify the values.

b. When the contract requires desanding, the sand content shall not exceed 4% percent (by volume) in the bore hole as resolved by the American Petroleum Institute sand content test.

c. Submit changes for acceptance in writing by the Engineer.

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TABLE 511-2 - Shore Pac GCV (CETCO Drilling Products Group) IN FRESH WATER

Property	Range of Values *		Test Method
	Time of Slurry Introduction	In Hole At Time Of Concreting	
Density (pcf)	Less than or equal to 64.0**	Less than or equal to 64.0**	Density Balance
Viscosity (sec/qt)	33 - 74	Less than or equal to 57	Marsh Cone
PH	8.0 – 11.0	8.0 – 11.0	pH paper pH meter

* At 20 ^{0} C
** Increase by two pounds per cubic foot in salt water

Notes: a. When the Contractor does not need to control the bottom hole conditions or when tests show that other criteria are appropriate, the Engineer may modify the values.

b. When the contract requires desanding, the sand content shall not exceed 0.5% percent (by volume) in the bore hole as resolved by the American Petroleum Institute sand content test.

c. Submit changes for acceptance in writing by the Engineer.

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TABLE 511-3 - SLURRYPRO CDP (KB Technologies Ltd.) IN FRESH WATER

Property	Range of Values *		Test Method
	Time of Slurry Introduction	In Hole At Time Of Concreting	
Density (pcf)	Less than or equal to 67.0**	Less than or equal to 64.0**	Density Balance
Viscosity (sec/qt)	50 - 120	Less than or equal to 70	Marsh Cone
PH	6.0 – 11.5	6.0 – 11.5	pH paper pH meter

* At 20^0 C

** Increase by two pounds per cubic foot in salt water

Notes: a. When the Contractor does not need to control the bottom hole conditions or when tests show that other criteria are appropriate, the Engineer may modify the values.

b. When the contract requires desanding, the sand content shall not exceed 0.5% percent (by volume) in the bore hole as resolved by the American Petroleum Institute sand content test.

c. Submit changes for acceptance in writing by the Engineer.

Before placing concrete in the shaft excavation, take slurry samples from the base of the shaft using a sampling tool. Extract slurry samples from the base of the shaft and at intervals not exceeding 10 feet up the shaft. Extract samples until two consecutive samples produce acceptable values for density, viscosity, pH, and sand content (within the values shown on Table 511-1 – Mineral Slurry in Fresh Water or Table 511-2 - Shore Pac GCV (CETCO Drilling Products Group) In Fresh Water or Table 511-3 - SLURRYPRO CDP (KB Technologies Ltd.) In Fresh Water).

Ensure that the bottom of the shaft does not accumulate heavily contaminated slurry suspension. The heavily contaminated slurry suspension could impair the free flow of concrete. When finding unacceptable slurry samples, take actions necessary to bring the slurry as specified in the contract. Do not pour the concrete until re-sampling and testing results produce acceptable values.

Furnish the reports of tests required above to the Engineer on completion of each drilled shaft. An authorized person of the Contractor shall sign the reports.

During construction, maintain at the level of slurry not less than five feet above the highest piezometric water pressure along the depth of a shaft. When the slurry construction method fails, stop this method and propose an alternate method for acceptance by the Engineer.

The Contractor shall use and dispose of slurry in accordance with applicable Federal, State, and County requirements.

(J) Excavation Inspection. Provide equipment for checking the dimensions and alignment of each permanent shaft excavation. Determine the dimensions and alignment according to the contract. Measure the final shaft depths with a suitable weighted tape after final cleaning.

A minimum of 50% of the base of each shaft shall have less than 0.5 inch of sediment at the time the concrete is placed. The maximum depth of sediment or debris on the base of the shaft shall not exceed 1.5 inches. The Contractor will measure the shaft cleanliness in the presence of the Engineer by methods deemed appropriate to the Engineer.

Also, for dry excavations the maximum depth of water shall not exceed 3 inches before pouring the concrete.

(K) Reinforcing Steel Cage Construction and Placement. Assemble and place the reinforcing steel cage immediately after the Engineer inspects and accepts the shaft excavation before pouring the concrete. To prevent deformation of the cage while lifting, brace the reinforcing steel cage until the cage is in its final position. The reinforcing steel cage includes longitudinal bars, ties, cage stiffener bars, spacers, centralizers, and other necessary appurtenances to acceptably complete and place the cage.

Tie and support the reinforcing steel in the shaft so that the reinforcing steel will remain within allowable tolerances given in Subsection 511.03(N) – Construction Tolerances. Use the concrete spacers or other approved non-corrosive spacing devices at sufficient intervals (near the bottom and at intervals not exceeding 10 feet up the shaft) to ensure concentric spacing for the entire cage length. Use minimum of four spacers, equally spaced around circumference, at each vertical interval. The spacers shall be constructed of accepted material equal in quality and durability to concrete specified for the shaft, and shall be of adequate dimension to insure the minimum annular space shown on the drawings between the outer portion of the reinforcing steel cage and the side of the excavated hole. Provide accepted cylindrical concrete

bottom supports to maintain the proper distance between bottom of the cage and base of the shaft excavation.

Check the elevation of the top of the steel reinforcing cage before and after pouring the concrete. When not maintaining the rebar within the specified tolerances, make the corrections needed to bring to within tolerances of the contract. Do not construct additional shafts until after modifying the reinforcing steel cage support according to the contract.

When the bottom of the constructed shaft elevation is lower than shown in the contract, extend at least half of the longitudinal bars required in the upper portion of the shaft the additional length. Continue the spiral bars for the extra depth, spaced two-foot on center measured along the circumference of the reinforcing steel cage. Extend the stiffener bars to the final depth. These bars may be lap spliced or unspliced bars of the proper length. The Engineer will not permit welding to the reinforcing steel. Unless the extra depth of the drilled shaft is required due to modifications by the Engineer, the additional reinforcing bars shall be at no additional cost to the State.

(L) Crosshole Sonic Logging (CSL) Test Access Tubes. Installation of access tubes shall be in accordance with ASTM Standard Test Method for Integrity Testing of Concrete Deep Foundations by Ultrasonic Crosshole Testing Designation D 6760, except as modified herein. Install access tubes in all drilled shafts to allow performance of CSL tests. Attach CSL access tubes securely to the interior of the reinforcement cage as near to parallel as possible to the vertical center axis of the drilled shaft in each drilled shaft and in the pattern shown on the plans. Extend the access tubes from the bottom of the reinforcement cage to a height accessible for testing and at least 3.5 feet above the top of the shaft. The bottom of the access tube shall be capped permanently. Joints required to achieve full length of access tubes shall be watertight. Contractor shall take extra care to prevent damaging the access tubes during reinforcement cage installation. Fill the tubes with potable water to the top of the tubes as soon as the reinforcing steel cage is installed. Check for leakage, misalignment, and damage before placing concrete in the drilled shaft. Stop all leaks if present and repair any damages or misalignment before placement of concrete starts. Check water level as soon as possible after concrete placement (within 4 hours after concrete placement) and fill with potable water if needed. Check water level in tubes every day until CSL testing is completed. Top off tubes with potable water if needed to prevent the debonding of the CSL tubes from the drilled shaft concrete and thereby making testing invalid. Keep the water level of the CSL tubes at the top and under no circumstances shall the water level in the CSL tube go below the concrete level. If leakage is detected after the pouring of the drilled shaft concrete, monitor and top off the CSL tubes

as often as needed to keep the water level in the tubes at the required level 24/7. Always reinstall the top watertight caps. Installation of CSL access tubes shall be incidental to the construction of the drilled shaft and shall be at no additional cost to the State.

The completed drilled shaft foundations will be tested by crosshole sonic logging (CSL) no sooner than 120 hours after the completion of the placement of the drilled shaft concrete, but no later than 20 days after concreting. The CSL test will be performed by the Engineer. The Contractor shall assist in the testing by making all the shafts in the project accessible to the Engineer; provide electricity, lights and other needs whenever requested by the Engineer. Assistance by the Contractor shall be incidental to the construction of the drilled shaft and shall be at no additional cost to the State. The Contractor shall provide accurate data on the dates and time of concrete placement for each drilled shaft and the surveyed location of each tube. Also, provide the elevation of the concrete at the top of the drilled shaft. The Engineer will require a minimum of 20-working days after testing of any drilled shaft to accept or reject that shaft.

The results of the CSL tests will be based on the percentage decrease in velocity as correlated to the following Concrete Condition Rating Criteria (CCRC), as shown in Table 511-4. The velocity reduction percentage will be calculated by comparing measured incremental velocity to the average velocity obtained from the tested drilled shaft. Should the compression test of the poured concrete not meet the requirements of the contract documents, the drilled shaft shall be considered defective and the "Concrete Condition Rating Criteria" shall not be used to validate the acceptability of the concrete. Deviations from the following values shall be used for determining the Concrete Condition Rating.

Table 511-4 Concrete Condition Rating Criteria

Concrete Condition Rating	Rating Symbol	Velocity Reduction	Indicative Results
Good	G	0 – 10%	Acceptable concrete
Questionable	Q	10% - 20%	Minor concrete contamination or intrusion. Questionable quality concrete.
Poor	P/D	> 20%	Defects exist, possible water slurry contamination, soil intrusion, and or poor quality concrete.

Table 511-4 Concrete Condition Rating Criteria			
Concrete Condition Rating	Rating Symbol	Velocity Reduction	Indicative Results
Water	W	V=4,750 – 5,000 feet/sec	Water intrusion or water filled gravel intrusion with few or no fines present.
No Signal	NS	No signal received	Soil intrusion or other severe defect absorbed the signal, tube debonding if near top.

Any drilled shaft may be designated by the Engineer to be cored. Core drilled shafts until the limits of the suspected defect zones are determined or until the Engineer requires the coring to stop. The Engineer shall determine the depth, location, and the number of core holes to be done. The core sample shall have a minimum actual diameter of 3 inches or 3 times the nominal maximum aggregate size of the concrete mix, whichever is larger. Provide concrete cores properly marked in a core box with labels of the drilled depth at each interval of core recovery to the Engineer for evaluation and testing. The Engineer will be allowed a minimum of 7 working days for evaluation and testing of the core samples.

Cost of coring performed on acceptable drilled shaft shall be borne by the State. Cost of coring performed on drilled shaft that have defects shall be borne by the Contractor. If the drilled shaft in question is on the critical path, a time extension and the linear foot payment for coring will be the sole remedy given if the drilled shaft has no defects. The delay will be calculated from the end of the 20 working days review period of the cores to when the last core was taken. Contractor shall submit a corrective methods plan for the defective shafts to the Engineer for review and approval prior to their use. The corrective methods plan shall restore the defective drilled shaft to a condition equal or better that of a drilled shaft that had no defects. Do not begin repair operations until receiving the Engineer's acceptance of the corrective methods plan for that defective drilled shaft.

After completion of the crosshole sonic logging tests and final acceptance of the drilled shaft, all the access tubes shall be completely filled using a tremie method of placement. Use non-shrink, non-metallic, non-gaseous grout of the same strength as the drilled shaft concrete. Filling the access tubes shall be at no additional cost to the State.

(M) Concrete Placement.

(1) General. Place the concrete through a concrete pump or other means as accepted by the Engineer using accepted methods as described below.

Concrete shall be placed in the shaft immediately after placing the reinforcing steel.

Concrete placement shall be continuous from the bottom to at least four feet above the top of shaft cutoff elevation. To ensure that the drilled shaft concrete is sound below the top of shaft cutoff elevation, the drilled shaft shall be poured at least four feet above the cutoff elevation and until good quality concrete is evident at least four feet above top of shaft cutoff elevation. The drilled shaft concrete above the cutoff elevation shall be removed no sooner than final set and 72 hours after the completion of the concrete pour. Final set shall be when the concrete has reached a compressive strength of 1,000 psi. Prior to removing the concrete above the cutoff elevation, a circumferential diamond blade sawcut 2 ½ inches deep shall be made at the cutoff elevation. Then the portion of the drilled shaft more than one foot above the cutoff elevation shall be removed with equipment no larger than a 90 pound pavement breaker. Thereafter the remaining one foot of the drilled shaft above the cutoff elevation shall be removed using jack hammers no heavier than 30 pounds for the upper nine inches and 15 pound maximum for the lowest three inches.

A minimum of four and two, 6-inch by 12-inch concrete cylinders shall be made for the compressive strength testing and unit weight testing (respectively). Production shafts with compressive strength less than the minimum 28-day compression strength will be considered defective. Shafts with air-dry core sample unit weight less than three pounds per cubic foot of the air-dry unit weight test cylinders will be considered defective. Contractor shall submit a corrective method plan for the defective shaft to the Engineer for review and approval prior to their use.

The elapsed time from the beginning of concrete placement in the shaft to the completion of the placement shall not exceed two hours. Adjust admixtures accepted by the Engineer so that concrete remains in a workable plastic state throughout 2-hour placement limit. A longer placement time may be requested, and requests shall be submitted to the Engineer for review and acceptance 30 days prior to the time the concrete pour (with a longer placement time) is needed. Should the Contractor exceed the 2-hour limit without obtaining prior acceptance by the Engineer,

the Contractor may be required to core the drilled shaft. These drilled shaft corings shall be at no additional cost to the State and no additional time will be granted.

Before placing the concrete, provide results of 3-day, 7-day, 14-day and 28-day compressive strength tests of a trial mix and a slump loss test at least 30 days prior to placement of concrete. Supply a concrete mix that will maintain a slump of four inches or greater after four hours from initial mixing. Conduct the trial mix and slump loss tests using concrete and under ambient temperatures appropriate for the site conditions. The ambient temperature used shall be the temperature at the elevation of existing ground before any excavation started.

The top surface of the drilled shafts shall be leveled, cleaned, and roughened prior to concrete placement for the footing.

(2) Monitoring Concrete Volume. For each drilled shaft, prepare and submit a monitoring record the next working day after concrete placement has been completed. All monitoring shall be performed in the presence of the Engineer or his representative. As a minimum, the monitoring record shall consist of the following:

(a) A chart that is made up after drilled shaft excavation has been completed and accepted by the Engineer and before concrete placement has commenced. Indicated on the chart, depth of hole plotted with theoretical volume of concrete to fill drilled shaft hole. Plot concrete elevation (surface) along the vertical axis and concrete volume along the horizontal axis.

(b) As concrete is being place, measure concrete surface at an interval of approximately each cubic yard of concrete discharged. Plot concrete volume actually placed at each elevation point. Use this chart to determine if any necking down or enlargement of shaft has occurred during concrete placement.

(c) Keep records of steel and concrete movement to document the following conditions:

(1) When removing temporary or permanent casing, elevation of the top of reinforcing cage shall not rise more than 2 inches from its original elevation;

(2) As temporary casing is extracted, static level of fluid concrete shall not rise.

(3) Concreting by Pump. Concrete pumps and discharge lines for concrete placement in wet or dry excavations may be used. Pumps and pump lines used to place concrete shall be of sufficient length, weight, and diameter to discharge concrete at the shaft base elevation. The pump and pump lines that will come in contact with concrete shall not contain aluminum parts. Discharge line shall have a minimum diameter of 4 inches and watertight joints. Concrete placement shall not begin until the pump line discharge orifice is at the shaft base elevation.

For wet excavations, use a plug to separate the concrete from the fluid in the hole until pumping begins. Remove the plug from the excavation or use plugs, made from a material accepted by the Engineer that will not cause a defect, if not removed.

The discharge orifice shall remain at least five feet below the surface of the fluid concrete. When lifting the pump line during concreting, reduce the line pressure temporarily until the orifice at a higher level in the excavation has been repositioned.

When removing the pumpline orifice from the fluid concrete column and discharging concrete above the rising concrete level during the concrete pour, the Engineer will consider the shaft defective. In such case, remove the reinforcing cage and concrete, the necessary sidewall removal specified by the Engineer, and repour the shaft. Costs of replacement of defective shafts shall be at no costs to the State and no additional time will be granted.

(N) Construction Tolerances. The following construction tolerances apply to drilled shafts:

(1) The drilled shaft shall be within 1/12 of the shaft diameter or 3 inches, whichever is less, in the horizontal plane at the plan elevation for the top of the shaft.

(2) The vertical alignment of the shaft excavation shall not vary from the plan alignment by more than 0.25 inch per foot of depth. The alignment of a battered shaft excavation shall not vary by more than 0.5 inch per foot of depth from the prescribed batter.

(3) After placing the concrete, the top of the reinforcing steel cage shall be no more than 6.0 inches above and no more than 3.0 inches below plan position.

(4) The cutoff (top) elevation of the shaft shall have a tolerance of ± 0.5 inch from the plan top of shaft elevation.

(5) The dimensions of casing are subject to American Pipe Institute tolerances applicable to regular steel pipe.

(6) Design the excavation equipment and methods so that the completed shaft excavation will have a flat bottom. The cutting edges of excavation equipment shall be normal to the vertical axis of the equipment within a tolerance of ± 3/8 inch per foot of diameter.

(7) Casing diameters shown in the contract documents to outside diameter (OD) dimensions. When accepted by the Engineer, a casing larger in diameter than shown in the contract documents may be provided to facilitate meeting this requirement. When using a series of telescoping casings, size casing to maintain shaft diameters.

Drilled shaft excavations that cannot be completed within the required tolerances are unacceptable. When accepted by the Engineer, corrections may be made to an unacceptable drilled shaft excavation by accepted combination of the following methods:

(1) Overdrill the shaft excavation to a larger diameter to permit accurate placement of the reinforcing steel cage with the required minimum concrete cover.

(2) Increase the number, size, or length of the reinforcing steel.

(3) Redesign the foundation.

(4) Other methods accepted by the Engineer.

The acceptance of correction procedures is dependent on analysis of the effect of the degree of misalignment and improper positioning. The Contractor is solely responsible to submit remedial repair procedures that shall make the structure equal to or better than the original design. The Engineer will solely determine if the remedial repair meets the requirements and is acceptable. A Hawaii Licensed Professional Structural Engineer and a Hawaii Licensed Professional Civil Engineer who specializes in Geotechnical Engineering shall stamp and sign the redesign drawings and computations. Correct out of tolerance drilled shaft excavations including engineering analysis and redesign at no cost to the

State. No time extension will be granted for any impact to the critical path due to the Contractor's incorrect installation of the drilled shaft.

(O) As-Built Drilled Shaft Location. The Contractor shall provide survey ties to all as-built location of all drilled shafts.

The Contractor shall notify the Engineer prior to performing the survey work and the Contractor shall survey the drilled shafts under the supervision of the Engineer or the Engineer's representative. A copy of the survey notes and the scaled plan locating all the completed drilled shafts in a given footing shall be submitted to the Engineer for review and approval. Submit accepted copy of the survey notes and the scaled plan as an electronic file, the Engineer will determine the acceptable format and media.

No form work for any footing shall proceed until the drilled shafts are found acceptable by the Engineer.

(P) Coring for Integrity Testing. Integrity testing will be performed on drilled shafts as determined by the Engineer. Integrity testing shall consist of partial or full depth concrete coring at drilled shafts determined by the Engineer. Coring shall be performed by the Contractor at the locations designated by the Engineer in the presence of the Engineer. The Engineer will solely determine if the cored shaft is acceptable or defective. Defective shafts shall be replaced or repair drawings and computations by a structural engineer and a civil engineer specializing in the geotechnical practice both licensed in the State of Hawaii. All remedial repairs shall have drawings and calculations signed and stamped by both of the above licensed engineers. The Contractor shall core vertical holes at locations and depths determined by the Engineer. The number of core holes to be done shall be determined by the Engineer. The core hole shall be at the specified location, to the specified depth, free of any foreign materials, and accepted by the Engineer before the cored hole is filled with grout. The recovered core samples shall have a minimum diameter of 3 inches or 3 times the nominal maximum aggregate size of the concrete mix, use whichever is larger. The cored holes shall be filled with prepackaged, non-shrink, non-metallic, non-gaseous grout of the same minimum strength as the drilled shaft with added corrosion inhibitor.

511.04 Method of Measurement.

(A) Furnishing Drilled Shaft Drilling Equipment. The Engineer will not measure furnishing drilled shaft drilling equipment for payment.

(B) Obstructions. The Engineer will measure obstructions per hour.

The Engineer will not include length of time required to remove obstructions from the other excavation items.

(C) Load Test. The Engineer will pay for load test per each.

(D) Unclassified Shaft Excavation. The Engineer will measure unclassified shaft excavation per linear foot.

The Engineer will measure the length along the centerline of the shaft including bells. The length shall be the elevation difference between the plan top of shaft and the final bottom of shaft. The Engineer shall maintain a drilled shaft log for payment.

The Engineer will not measure any length of drilled shafts required due to unauthorized over-excavation.

(E) Drilled Shafts. The Engineer will measure drilled shafts per linear foot. The Engineer will measure the length along the centerline of the shaft including bells. The length shall be the elevation difference between the plan top of the shaft and the final bottom of shaft. The Engineer will maintain a drilled shaft log for payment.

(F) Coring for Integrity Testing. The Engineer will measure coring for integrity testing per linear foot. The length shall be the elevation difference between the plan top of drilled shaft to the final bottom of shaft. The Engineer will maintain a coring log for payment.

511.05 Basis of Payment.

(A) Furnishing Drilled Shaft Drilling Equipment. The Engineer will pay for the accepted furnishing drilled shaft drilling equipment on a lump sum basis complete in place.

The price includes full compensation for furnishing and moving the drilling equipment and necessary tools and equipment to the project, setting the equipment up at the locations and removing the equipment from the project.

The Engineer will make payment of 60% of the contract amount for this item when all drilling equipment is ready to drill the Test Shaft.

The Engineer will make payment for the remaining 40% of the contract amount when all shaft concrete has been placed up to the top of the shafts.

(B) Obstructions. The Engineer will pay for the accepted removal of obstructions at the contract unit price per hour complete in place. The

maximum payment per designated obstruction shall not exceed 20 times the unit cost for unclassified shaft excavation of the diameter excavated. The price includes full compensation for removing the obstruction and furnishing all labor, materials, tools, equipment, and incidentals necessary to complete the work.

(C) Load Test. The Engineer will pay for the accepted drilled shaft load test at the contract unit price per each complete in place.

The price includes full compensation for drilling, caliper testing, placing permanent steel casing and concrete, furnishing and installing reinforcing steel, furnishing and installing load cells, instrumentation, collecting data, keeping records and furnishing labor, materials, equipment, tools and incidentals necessary to complete the work.

(D) Unclassified Shaft Excavation. The Engineer will pay for the accepted unclassified shaft excavation at the contract unit price per linear foot complete in place.

The price includes full compensation for excavating, removing and disposing of excavated materials, using slurry as necessary, and furnishing labor, materials, equipment, tools and incidentals necessary to complete the work.

The Engineer will not pay any length of drilled shafts required due to unauthorized over-excavation.

(E) Drilled Shafts. The Engineer will pay for the accepted drilled shafts at the contract unit price per linear foot complete in place.

The price includes full compensation for reinforcing and concreting the production shafts, inspecting the shafts such as the use of video cameras and lights, monitors and cables, and safety cages, and furnishing labor, materials, equipment, tools and incidentals (including access tubes for CSL testing) necessary to complete the work.

(F) Coring for Integrity Testing for Acceptable Drilled Shaft. The Engineer will pay for the accepted coring for integrity testing at the contract unit price per linear foot complete in place. The Engineer will not pay for coring performed on defective drilled shaft.

The price includes full compensation for testing the drilled shafts for soundness and integrity by coring, filling the cored holes with non-shrink grout, and furnishing labor, materials, equipment, tools and incidentals necessary to complete the work.

The Engineer will make payment under the following:

Pay Item	**Pay Unit**
Furnishing Drilled Shaft Drilling Equipment	Lump Sum
Obstructions	Hour
Load Test	Each
Unclassified Shaft Excavations (___-inch diameter)	Linear Foot
Drilled Shafts (___-inch diameter)	Linear Foot
Coring for Integrity Testing for Acceptable Drilled Shaft	Linear Foot”

END OF SECTION 511

"General Decision Number: HI20210001 09/10/2021

Superseded General Decision Number: HI20200001

State: Hawaii

Construction Types: Building, Heavy (Heavy and Dredging), Highway and Residential

Counties: Hawaii Statewide.

BUILDING CONSTRUCTION PROJECTS; RESIDENTIAL CONSTRUCTION PROJECTS (consisting of single family homes and apartments up to and including 4 stories); HEAVY AND HIGHWAY CONSTRUCTION PROJECTS AND DREDGING

Note: Under Executive Order (EO) 13658, an hourly minimum wage of $10.95 for calendar year 2021 applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2015. If this contract is covered by the EO, the contractor must pay all workers in any classification listed on this wage determination at least $10.95 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in calendar year 2021. If this contract is covered by the EO and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must pay workers in that classification at least the wage rate determined through the conformance process set forth in 29 CFR 5.5(a)(1)(ii) (or the EO minimum wage rate,if it is higher than the conformed wage rate). The EO minimum wage rate will be adjusted annually. Please note that this EO applies to the above-mentioned types of contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but it does not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60). Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/01/2021
1	01/08/2021
2	01/22/2021
3	02/12/2021
4	02/19/2021
5	03/19/2021
6	05/07/2021
7	07/02/2021
8	07/09/2021
9	07/16/2021
10	09/03/2021
11	09/10/2021

ASBE0132-001 08/30/2020

	Rates	Fringes
Asbestos Workers/Insulator Includes application of all insulating materials,		

protective coverings, coatings and finishes to all types of mechanical systems. Also the application of firestopping material for wall openings and penetrations in walls, floors, ceilings and curtain walls.....$ 41.90 25.65

BOIL0627-005 01/01/2013

	Rates	Fringes
BOILERMAKER	$ 35.20	27.35

BRHI0001-001 08/31/2020

	Rates	Fringes
BRICKLAYER		
Bricklayers and Stonemasons	$ 45.95	29.59
Pointers, Caulkers and Weatherproofers	$ 46.21	29.59

BRHI0001-002 08/31/2020

	Rates	Fringes
Tile, Marble & Terrazzo Worker		
Terrazzo Base Grinders	$ 41.69	28.11
Terrazzo Floor Grinders and Tenders	$ 40.14	28.11
Tile, Marble and Terrazzo Workers	$ 43.50	28.11

CARP0745-001 08/31/2020

	Rates	Fringes
Carpenters:		
Carpenters; Hardwood Floor Layers; Patent Scaffold Erectors (14 ft. and over); Piledrivers; Pneumatic Nailers; Wood Shinglers and Transit and/or Layout Man	$ 50.50	23.59
Millwrights and Machine Erectors	$ 50.75	23.59
Power Saw Operators (2 h.p. and over)	$ 50.65	23.59

CARP0745-002 08/31/2020

	Rates	Fringes
Drywall and Acoustical Workers and Lathers	$ 50.50	23.59

ELEC1186-001 08/23/2020

	Rates	Fringes

Electricians:
Cable Splicers.....$ 56.71 31.16
Electricians.....$ 51.55 29.58
Telecommunication worker....$ 32.69 12.96

ELEC1186-002 08/23/2020

	Rates	Fringes
Line Construction:		
Cable Splicers.....	$ 56.71	31.16
Groundmen/Truck Drivers.....	$ 38.66	25.63
Heavy Equipment Operators...	$ 46.40	28.00
Linemen.....	$ 51.55	29.58
Telecommunication worker....	$ 32.69	12.96

ELEV0126-001 01/01/2021

	Rates	Fringes
ELEVATOR MECHANIC.....	$ 63.18	35.825+a+b

a. VACATION: Employer contributes 8% of basic hourly rate for 5 years service and 6% of basic hourly rate for 6 months to 5 years service as vacation pay credit.

b. PAID HOLIDAYS: New Year's Day, Memorial Day, Independence Day, Labor Day, Veterans' Day, Thanksgiving Day, the Friday after Thanksgiving Day and Christmas Day.

ENGI0003-002 09/03/2018

	Rates	Fringes
Diver (Aqua Lung) (Scuba))		
Diver (Aqua Lung) (Scuba) (over a depth of 30 feet)...	$ 66.00	31.26
Diver (Aqua Lung) (Scuba) (up to a depth of 30 feet)..	$ 56.63	31.26
Stand-by Diver (Aqua Lung) (Scuba).....	$ 47.25	31.26
Diver (Other than Aqua Lung)		
Diver (Other than Aqua Lung).....	$ 66.00	31.26
Diver Tender (Other than Aqua Lung).....	$ 44.22	31.26
Stand-by Diver (Other than Aqua Lung).....	$ 47.25	31.26
Helicopter Work		
Airborne Hoist Operator for Helicopter.....	$ 45.80	31.26
Co-Pilot of Helicopter.....	$ 45.98	31.26
Pilot of Helicopter.....	$ 46.11	31.26
Power equipment operator - tunnel work		
GROUP 1.....	$ 42.24	31.26
GROUP 2.....	$ 42.35	31.26
GROUP 3.....	$ 42.52	31.26
GROUP 4.....	$ 42.79	31.26
GROUP 5.....	$ 43.10	31.26
GROUP 6.....	$ 43.75	31.26
GROUP 7.....	$ 44.07	31.26
GROUP 8.....	$ 44.18	31.26
GROUP 9.....	$ 44.29	31.26

GROUP 9A	$ 44.52	31.26
GROUP 10	$ 44.58	31.26
GROUP 10A	$ 44.73	31.26
GROUP 11	$ 44.88	31.26
GROUP 12	$ 45.24	31.26
GROUP 12A	$ 45.60	31.26
Power equipment operators:		
GROUP 1	$ 41.94	31.26
GROUP 2	$ 42.05	31.26
GROUP 3	$ 42.22	31.26
GROUP 4	$ 42.49	31.26
GROUP 5	$ 42.80	31.26
GROUP 6	$ 43.45	31.26
GROUP 7	$ 43.77	31.26
GROUP 8	$ 43.88	31.26
GROUP 9	$ 43.99	31.26
GROUP 9A	$ 44.22	31.26
GROUP 10	$ 44.28	31.26
GROUP 10A	$ 44.43	31.26
GROUP 11	$ 44.58	31.26
GROUP 12	$ 44.94	31.26
GROUP 12A	$ 45.30	31.26
GROUP 13	$ 42.22	31.26
GROUP 13A	$ 42.49	31.26
GROUP 13B	$ 42.80	31.26
GROUP 13C	$ 43.45	31.26
GROUP 13D	$ 43.77	31.26
GROUP 13E	$ 43.88	31.26

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Fork Lift (up to and including 10 tons); Partsman (heavy duty repair shop parts room when needed).

GROUP 2: Conveyor Operator (Handling building material); Hydraulic Monitor; Mixer Box Operator (Concrete Plant).

GROUP 3: Brakeman; Deckhand; Fireman; Oiler; Oiler/Gradechecker; Signalman; Switchman; Highline Cableway Signalman; Bargeman; Bunkerman; Concrete Curing Machine (self-propelled, automatically applied unit on streets, highways, airports and canals); Leveeman; Roller (5 tons and under); Tugger Hoist.

GROUP 4: Boom Truck or dual purpose ""A"" Frame Truck (5 tons or less); Concrete Placing Boom (Building Construction); Dinky Operator; Elevator Operator; Hoist and/or Winch (one drum); Straddle Truck (Ross Carrier, Hyster and similar).

GROUP 5: Asphalt Plant Fireman; Compressors, Pumps, Generators and Welding Machines (""Bank"" of 9 or more, individually or collectively); Concrete Pumps or Pumpcrete Guns; Lubrication and Service Engineer (Grease Rack); Screedman.

GROUP 6: Boom Truck or Dual Purpose ""A""Frame Truck (over 5 tons); Combination Loader/Backhoe (up to and including 3/4 cu. yd.); Concrete Batch Plants (wet or dry); Concrete Cutter, Groover and/or Grinder (self-propelled unit on streets, highways, airports, and canals); Conveyor or Concrete Pump (Truck or Equipment Mounted); Drilling Machinery (not to apply to waterliners, wagon drills or jack hammers); Fork Lift (over 10 tons); Loader (up to and including 3 and 1/2 cu. yds); Lull High Lift (under 40 feet); Lubrication and Service Engineer (Mobile); Maginnis

Internal Full Slab Vibrator (on airports, highways, canals and warehouses); Man or Material Hoist; Mechanical Concrete Finisher (Large Clary, Johnson Bidwell, Bridge Deck and similar); Mobile Truck Crane Driver; Portable Shotblast Concrete Cleaning Machine; Portable Boring Machine (under streets, highways, etc.); Portable Crusher; Power Jumbo Operator (setting slip forms, etc., in tunnels); Rollers (over 5 tons); Self-propelled Compactor (single engine); Self-propelled Pavement Breaker; Skidsteer Loader with attachments; Slip Form Pumps (Power driven by hydraulic, electric, air, gas, etc., lifting device for concrete forms); Small Rubber Tired Tractors; Trencher (up to and including 6 feet); Underbridge Personnel Aerial Platform (50 feet of platform or less).

GROUP 7: Crusher Plant Engineer, Dozer (D-4, Case 450, John Deere 450, and similar); Dual Drum Mixer, Extend Lift; Hoist and/or Winch (2 drums); Loader (over 3 and 1/2 cu. yds. up to and including 6 yards.); Mechanical Finisher or Spreader Machine (asphalt), (Barber Greene and similar) (Screedman required); Mine or Shaft Hoist; Mobile Concrete Mixer (over 5 tons); Pipe Bending Machine (pipelines only); Pipe Cleaning Machine (tractor propelled and supported); Pipe Wrapping Machine (tractor propelled and supported); Roller Operator (Asphalt); Self-Propelled Elevating Grade Plane; Slusher Operator; Tractor (with boom) (D-6, or similar); Trencher (over 6 feet and less than 200 h.p.); Water Tanker (pulled by Euclids, T-Pulls, DW-10, 20 or 21, or similar); Winchman (Stern Winch on Dredge).

GROUP 8: Asphalt Plant Operator; Barge Mate (Seagoing); Cast-in-Place Pipe Laying Machine; Concrete Batch Plant (multiple units); Conveyor Operator (tunnel); Deckmate; Dozer (D-6 and similar); Finishing Machine Operator (airports and highways); Gradesetter; Kolman Loader (and similar); Mucking Machine (Crawler-type); Mucking Machine (Conveyor-type); No-Joint Pipe Laying Machine; Portable Crushing and Screening Plant; Power Blade Operator (under 12); Saurman Type Dragline (up to and including 5 yds.); Stationary Pipe Wrapping, Cleaning and Bending Machine; Surface Heater and Planer Operator, Tractor (D-6 and similar); Tri-Batch Paver; Tunnel Badger; Tunnel Mole and/or Boring Machine Operator Underbridge Personnel Aerial Platform (over 50 feet of platform).

GROUP 9: Combination Mixer and Compressor (gunite); Do-Mor Loaderand Adams Elegrader; Dozer (D-7 or equal); Wheel and/or Ladder Trencher (over 6 feet and 200 to 749 h.p.).

GROUP 9A: Dozer (D-8 and similar); Gradesetter (when required by the Contractor to work from drawings, plans or specifications without the direct supervision of a foreman or superintendent); Push Cat; Scrapers (up to and including 20 cu. yds); Self-propelled Compactor with Dozer; Self-Propelled, Rubber-Tired Earthmoving Equipment (up to and including 20 cu. yds) (621 Band and similar); Sheep's Foot; Tractor (D-8 and similar); Tractors with boom (larger than D-6, and similar).

GROUP 10: Chicago Boom; Cold Planers; Heavy Duty Repairman or Welder; Hoist and/or Winch (3 drums); Hydraulic Skooper (Koehring and similar); Loader (over 6 cu. yds. up to and including 12 cu. yds.); Saurman type Dragline (over 5 cu. yds.); Self-propelled, rubber-tired Earthmoving Equipment (over 20 cu. yds. up to and including 31 cu. yds.) (637D

and similar); Soil Stabilizer (P & H or equal); Sub-Grader (Gurries or other automatic type); Tractors (D-9 or equivalent, all attachments); Tractor (Tandem Scraper); Watch Engineer.

GROUP 10A: Boat Operator; Cable-operated Crawler Crane (up to and including 25 tons); Cable-operated Power Shovel, Clamshell, Dragline and Backhoe (up to and including 1 cu. yd.); Dozer D9-L; Dozer (D-10, HD41 and similar) (all attachments); Gradall (up to and including 1 cu. yd.); Hydraulic Backhoe (over 3/4 cu. yds. up to and including 2 cu. yds.); Mobile Truck Crane Operator (up to and including 25 tons) (Mobile Truck Crane Driver Required); Self-propelled Boom Type Lifting Device (Center Mount) (up to and including 25 tons) (Grove, Drott, P&H, Pettibone and similar; Trencher (over 6 feet and 750 h.p. or more); Watch Engineer (steam or electric).

GROUP 11: Automatic Slip Form Paver (concrete or asphalt); Band Wagon (in conjunction with Wheel Excavator); Cable-operated Crawler Cranes (over 25 tons but less than 50 tons); Cable-operated Power Shovel, Clamshell, Dragline and Backhoe (over 1 cu. yd. up to 7 cu. yds.); Gradall (over 1 cu. yds. up to 7 cu. yds.); DW-10, 20, etc. (Tandem); Earthmoving Machines (multiple propulsion power units and 2 or more Scrapers) (up to and including 35 cu. yds.,"" struck"" m.r.c.); Highline Cableway; Hydraulic Backhoe (over 2 cu. yds. up to and including 4 cu. yds.); Leverman; Lift Slab Machine; Loader (over 12 cu. yds); Master Boat Operator; Mobile Truck Crane Operator (over 25 tons but less than 50 tons); (Mobile Truck Crane Driver required); Pre-stress Wire Wrapping Machine; Self-propelled Boom-type Lifting Device (Center Mount) (over 25 tons m.r.c); Self-propelled Compactor (with multiple-propulsion power units); Single Engine Rubber Tired Earthmoving Machine (with Tandem Scraper); Tandem Cats; Trencher (pulling attached shield).

GROUP 12: Clamshell or Dipper Operator; Derricks; Drill Rigs; Multi-Propulsion Earthmoving Machines (2 or more Scrapers) (over 35 cu. yds ""struck""m.r.c.); Operators (Derricks, Piledrivers and Cranes); Power Shovels and Draglines (7 cu. yds. m.r.c. and over); Self-propelled rubber-tired Earthmoving equipment (over 31 cu. yds.) (657B and similar); Wheel Excavator (up to and including 750 cu. yds. per hour); Wheel Excavator (over 750 cu. yds. per hour).

GROUP 12A: Dozer (D-11 or similar or larger); Hydraulic Excavators (over 4 cu. yds.); Lifting cranes (50 tons and over); Pioneering Dozer/Backhoe (initial clearing and excavation for the purpose of providing access for other equipment where the terrain worked involves 1-to-1 slopes that are 50 feet in height or depth, the scope of this work does not include normal clearing and grubbing on usual hilly terrain nor the excavation work once the access is provided); Power Blade Operator (Cat 12 or equivalent or over); Straddle Lifts (over 50 tons); Tower Crane, Mobile; Traveling Truss Cranes; Universal, Liebher, Linden, and similar types of Tower Cranes (in the erection, dismantling, and moving of equipment there shall be an additional Operating Engineer or Heavy Duty Repairman); Yo-Yo Cat or Dozer.

GROUP 13: Truck Driver (Utility, Flatbed, etc.)

GROUP 13A: Dump Truck, 8 cu.yds. and under (water level); Water Truck (up to and including 2,000 gallons).

GROUP 13B: Water Truck (over 2,000 gallons); Tandem Dump Truck, over 8 cu. yds. (water level).

GROUP 13C: Truck Driver (Semi-trailer. Rock Cans, Semi-Dump or Roll-Offs).

GROUP 13D: Truck Driver (Slip-In or Pup).

GROUP 13E: End Dumps, Unlicensed (Euclid, Mack, Caterpillar or similar); Tractor Trailer (Hauling Equipment); Tandem Trucks hooked up to Trailer (Hauling Equipment)

BOOMS AND/OR LEADS (HOURLY PREMIUMS):

The Operator of a crane (under 50 tons) with a boom of 80 feet or more (including jib), or of a crane (under 50 tons) with leads of 100 feet or more, shall receive a per hour premium for each hour worked on said crane (under 50 tons) in accordance with the following schedule:

Booms of 80 feet up to but not including 130 feet or Leads of 100 feet up to but not including 130 feet	0.50
Booms and/or Leads of 130 feet up to but not including 180 feet	0.75
Booms and/or Leads of 180 feet up to and including 250 feet	1.15
Booms and/or Leads over 250 feet	1.50

The Operator of a crane (50 tons and over) with a boom of 180 feet or more (including jib) shall receive a per hour premium for each hour worked on said crane (50 tons and over) in accordance with the following schedule:

Booms of 180 feet up to and including 250 feet	1.25
Booms over 250 feet	1.75

ENGI0003-004 09/04/2017

	Rates	Fringes
Dredging: (Boat Operators)		
Boat Deckhand	$ 41.22	30.93
Boat Operator	$ 43.43	30.93
Master Boat Operator	$ 43.58	30.93
Dredging: (Clamshell or Dipper Dredging)		
GROUP 1	$ 43.94	30.93
GROUP 2	$ 43.28	30.93
GROUP 3	$ 42.88	30.93
GROUP 4	$ 41.22	30.93
Dredging: (Derricks)		
GROUP 1	$ 43.94	30.93
GROUP 2	$ 43.28	30.93
GROUP 3	$ 42.88	30.93
GROUP 4	$ 41.22	30.93
Dredging: (Hydraulic Suction Dredges)		

GROUP 1	$ 43.58	30.93
GROUP 2	$ 43.43	30.93
GROUP 3	$ 43.28	30.93
GROUP 4	$ 43.22	30.93
GROUP 5	$ 37.88	26.76
Group 5	$ 42.88	30.93
GROUP 6	$ 37.77	26.76
Group 6	$ 42.77	30.93
GROUP 7	$ 36.22	26.76
Group 7	$ 41.22	30.93

CLAMSHELL OR DIPPER DREDGING CLASSIFICATIONS

GROUP 1: Clamshell or Dipper Operator.
GROUP 2: Mechanic or Welder; Watch Engineer.
GROUP 3: Barge Mate; Deckmate.
GROUP 4: Bargeman; Deckhand; Fireman; Oiler.

HYDRAULIC SUCTION DREDGING CLASSIFICATIONS

GROUP 1: Leverman.
GROUP 2: Watch Engineer (steam or electric).
GROUP 3: Mechanic or Welder.
GROUP 4: Dozer Operator.
GROUP 5: Deckmate.
GROUP 6: Winchman (Stern Winch on Dredge)
GROUP 7: Deckhand (can operate anchor scow under direction of Deckmate); Fireman; Leveeman; Oiler.

DERRICK CLASSIFICATIONS

GROUP 1: Operators (Derricks, Piledrivers and Cranes).
GROUP 2: Saurman Type Dragline (over 5 cubic yards).
GROUP 3: Deckmate; Saurman Type Dragline (up to and including 5 yards).
GROUP 4: Deckhand, Fireman, Oiler.

ENGI0003-044 09/03/2018

	Rates	Fringes
Power Equipment Operators (PAVING)		
Asphalt Concrete Material Transfer	$ 42.92	32.08
Asphalt Plant Operator	$ 43.35	32.08
Asphalt Raker	$ 41.96	32.08
Asphalt Spreader Operator	$ 43.44	32.08
Cold Planer	$ 43.75	32.08
Combination Loader/Backhoe (over 3/4 cu.yd.)	$ 41.96	32.08
Combination Loader/Backhoe (up to 3/4 cu.yd.)	$ 40.98	32.08
Concrete Saws and/or Grinder (self-propelled unit on streets, highways, airports and canals)	$ 42.92	32.08
Grader	$ 43.75	32.08
Laborer, Hand Roller	$ 41.46	32.08
Loader (2 1/2 cu. yds. and under)	$ 42.92	32.08
Loader (over 2 1/2 cu. yds. to and including 5 cu. yds.)	$ 43.24	32.08

Roller Operator (five tons and under)	$ 41.69	32.08
Roller Operator (over five tons)	$ 43.12	32.08
Screed Person	$ 42.92	32.08
Soil Stabilizer	$ 43.75	32.08

IRON0625-001 09/01/2020

	Rates	Fringes
Ironworkers:	$ 42.50	36.84

a. Employees will be paid $.50 per hour more while working in tunnels and coffer dams; $1.00 per hour more when required to work under or are covered with water (submerged) and when they are required to work on the summit of Mauna Kea, Mauna Loa or Haleakala.

LABO0368-001 09/02/2020

	Rates	Fringes
Laborers:		
Driller	$ 39.70	22.68
Final Clean Up	$ 29.65	18.17
Gunite/Shotcrete Operator and High Scaler	$ 39.20	22.68
Laborer I	$ 38.70	22.68
Laborer II	$ 36.10	22.68
Mason Tender/Hod Carrier	$ 39.20	22.68
Powderman	$ 39.70	22.68
Window Washer (bosun chair)	$ 38.20	22.68

LABORERS CLASSIFICATIONS

Laborer I: Air Blasting run by electric or pneumatic compressor; Asphalt Laborer, Ironer, Raker, Luteman, and Handroller, and all types of Asphalt Spreader Boxes; Asphalt Shoveler; Assembly and Installation of Multiplates, Liner Plates, Rings, Mesh, Mats; Batching Plant (portable and temporary); Boring Machine Operator (under streets and sidewalks); Buggymobile; Burning and Welding; Chainsaw, Faller, Logloader, and Bucker; Compactors (Jackson Jumping Jack and similar); Concrete Bucket Dumpman; Concrete Chipping; Concrete Chuteman/Hoseman (pouring concrete) (the handling of the chute from ready-mix trucks for such jobs as walls, slabs, decks, floors, foundations, footings, curbs, gutters, and sidewalks); Concrete Core Cutter (Walls, Floors, and Ceiling); Concrete Grinding or Sanding; Concrete: Hooking on, signaling, dumping of concrete for treme work over water on caissons, pilings, abutments, etc.; Concrete: Mixing, handling, conveying, pouring, vibrating, otherwise placing of concrete or aggregates or by any other process; Concrete: Operation of motorized wheelbarrows or buggies or machines of similar character, whether run by gas, diesel, or electric power; Concrete Placement Machine Operator: operation of Somero Hammerhead, Copperheads, or similar machines; Concrete Pump Machine (laying, coupling, uncoupling of all connections and cleaning of equipment); Concrete and/or Asphalt Saw (Walking or Handtype) (cutting walls or flatwork) (scoring old or new concrete and/or asphalt) (cutting for expansion joints) (streets and ways for laying of pipe, cable or conduit for all purposes); Concrete Shovelers/Laborers (Wet or Dry); Concrete Screeding for Rough Strike-Off: Rodding

or striking-off, by hand or mechanical means prior to finishing; Concrete Vibrator Operator; Coring Holes: Walls, footings, piers or other obstructions for passage of pipes or conduits for any purpose and the pouring of concrete to secure the hole; Cribbers, Shorer, Lagging, Sheeting, and Trench Jacking and Bracing, Hand-Guided Lagging Hammer Whaling Bracing; Curbing (Concrete and Asphalt); Curing of Concrete (impervious membrane and form oiler) mortar and other materials by any mode or method; Cut Granite Curb Setter (setting, leveling and grouting of all precast concrete or stone curbs); Cutting and Burning Torch (demolition); Dri Pak-It Machine; Environmental Abatement: removal of asbestos, lead, and bio hazardous materials (EPA and/or OSHA certified); Falling, bucking, yarding, loading or burning of all trees or timber on construction site; Forklift (9 ft. and under); Gas, Pneumatic, and Electric tools; Grating and Grill work for drains or other purposes; Green Cutter of concrete or aggregate in any form, by hand, mechanical means, grindstone or air and/or water; Grout: Spreading for any purpose; Guinea Chaser (Grade Checker) for general utility trenches, sitework, and excavation; Headerboard Man (Asphalt or Concrete); Heat Welder of Plastic (Laborers' AGC certified workers) (when work involves waterproofing for waterponds, artificial lakes and reservoir) heat welding for sewer pipes and fusion of HDPE pipes; Heavy Highway Laborer (Rigging, signaling, handling, and installation of pre-cast catch basins, manholes, curbs and gutters); High Pressure Nozzleman - Hydraulic Monitor (over 100# pressure); Jackhammer Operator; Jacking of slip forms: All semi and unskilled work connected therewithin; Laying of all multi-cell conduit or multi-purpose pipe; Magnesite and Mastic Workers (Wet or Dry)(including mixer operator);Mortar Man; Mortar Mixer (Block, Brick, Masonry, and Plastering); Nozzleman (Sandblasting and/or Water Blasting): handling, placing and operation of nozzle; Operation, Manual or Hydraulic jacking of shields and the use of such other mechanical equipment as may be necessary; Pavement Breakers; Paving, curbing and surfacing of streets, ways, courts, under and overpasses, bridges, approaches, slope walls, and all other labor connected therewith; Pilecutters; Pipe Accessment in place, bolting and lining up of sectional metal or other pipe including corrugated pipe; Pipelayer performing all services in the laying and installation of pipe from the point of receiving pipe in the ditch until completion of operation, including any and all forms of tubular material, whether pipe, HDPE, metallic or non-metallic, conduit, and any other stationary-type of tubular device used for conveying of any substance or element, whether water, sewage, solid, gas, air, or other product whatsoever and without regard to the nature of material from which tubular material is fabricated; No-joint pipe and stripping of same, Pipewrapper, Caulker, Bander, Kettlemen, and men applying asphalt, Laykold, treating Creosote and similar-type materials (6-inch) pipe and over); Piping: resurfacing and paving of all ditches in preparation for laying of all pipes; Pipe laying of lateral sewer pipe from main or side sewer to buildings or structure (except Contactor may direct work be done under proper supervision); Pipe laying, leveling and marking of the joint used for main or side sewers and storm sewers; Laying of all clay, terra cotta, ironstone, vitrified concrete, HDPE or other pipe for drainage; Placing and setting of water mains, gas mains and all pipe including removal of skids; Plaster Mortar Mixer/Pump; Pneumatic Impact Wrench; Portable Sawmill

Operation: Choker setters, off bearers, and lumber handlers connected with clearing; Posthole Digger (Hand Held, Gas, Air and Electric); Powderman's Tender; Power Broom Sweepers (Small); Preparation and Compaction of roadbeds for railroad track laying, highway construction, and the preparation of trenches, footings, etc., for cross-country transmission by pipelines, electrical transmission or underground lines or cables (by mechanical means); Raising of structure by manual or hydraulic jacks or other methods and resetting of structure in new locations, including all concrete work; Ramming or compaction; Rigging in connection with Laborers' work (except demolition), Signaling (including the use of walkie talkie) Choke Setting, tag line usage; Tagging and Signaling of building materials into high rise units; Riprap, Stonepaver, and Rock Slinger (includes placement of stacked concrete, wet or dry and loading, unloading, signaling, slinging and setting of other similar materials); Rotary Scarifier (including multiple head concrete chipping Scarifier); Salamander Heater, Drying of plaster, concrete mortar or other aggregate; Scaffold Erector Leadman; Scaffolds: (Swing and hanging) including maintenance thereof; Scaler; Septic Tank/Cesspool and Drain Fields Digger and Installer; Shredder/Chipper (tree branches, brush, etc.); Stripping and Setting Forms; Stripping of Forms: Other than panel forms which are to be re-used in their original form, and stripping of forms on all flat arch work; Tampers (Barko, Wacker, and similar type); Tank Scaler and Cleaners; Tarman; Tree Climbers and Trimmers; Trencher (includes hand-held, Davis T-66 and similar type); Trucks (flatbed up to and including 2 1/2 tons when used in connection with on-site Laborers'work; Trucks (Refuse and Garbage Disposal) (from job site to dump); Vibra-Screed (Bull Float in connection with Laborers' work); Well Points, Installation of or any other dewatering system.

Laborer II: Asphalt Plant Laborer; Boring Machine Tender; Bridge Laborer; Burning of all debris (crates, boxes, packaging waste materials); Chainman, Rodmen, and Grade Markers; Cleaning, clearing, grading and/or removal for streets, highways, roadways, aprons, runways, sidewalks, parking areas, airports, approaches, and other similar installations; Cleaning or reconditioning of streets, ways, sewers and waterlines, all maintenance work and work of an unskilled and semi-skilled nature; Concrete Bucket Tender (Groundman) hooking and unhooking of bucket; Concrete Forms; moving, cleaning, oiling and carrying to the next point of erection of all forms; Concrete Products Plant Laborers; Conveyor Tender (conveying of building materials); Crushed Stone Yards and Gravel and Sand Pit Laborers and all other similar plants; Demolition, Wrecking and Salvage Laborers: Wrecking and dismantling of buildings and all structures, with use of cutting or wrecking tools, breaking away, cleaning and removal of all fixtures, All hooking, unhooking, signaling of materials for salvage or scrap removed by crane or derrick; Digging under streets, roadways, aprons or other paved surfaces; Driller's Tender; Chuck Tender, Outside Nipper; Dry-packing of concrete (plugging and filling of she-bolt holes); Fence and/or Guardrail Erector: Dismantling and/or re-installation of all fence; Finegrader; Firewatcher; Flagman (Coning, preparing, stablishing and removing portable roadway barricade devices); Signal Men on all construction work defined herein, including Traffic Control Signal Men at construction site; General Excavation; Backfilling, Grading

and all other labor connected therewith; Digging of trenches, ditches and manholes and the leveling, grading and other preparation prior to laying pipe or conduit for any purpose; Excavations and foundations for buildings, piers, foundations and holes, and all other construction. Preparation of street ways and bridges; General Laborer: Cleaning and Clearing of all debris and surplus material. Clean-up of right-of-way. Clearing and slashing of brush or trees by hand or mechanical cutting. General Clean up: sweeping, cleaning, wash-down, wiping of construction facility and equipment (other than ""Light Clean up (Janitorial) Laborer. Garbage and Debris Handlers and Cleaners. Appliance Handling (job site) (after delivery unlading in storage area); Ground and Soil Treatment Work (Pest Control); Gunite/Shotcrete Operator Tender; Junk Yard Laborers (same as Salvage Yard); Laser Beam ""Target Man"" in connection with Laborers' work; Layout Person for Plastic (when work involves waterproofing for waterponds, artificial lakes and reservoirs); Limbers, Brush Loaders, and Pilers; Loading, Unloading, carrying, distributing and handling of all rods and material for use in reinforcing concrete construction (except when a derrick or outrigger operated by other than hand power is used); Loading, unloading, sorting, stockpiling, handling and distribution of water mains, gas mains and all pipes; Loading and unloading of all materials, fixtures, furnishings and appliances from point of delivery to stockpile to point of installation; hooking and signaling from truck, conveyance or stockpile; Material Yard Laborers; Pipelayer Tender; Pipewrapper, Caulker, Bander, Kettlemen, and men applying asphalt, Laykold, Creosote, and similar-type materials (pipe under 6 inches); Plasterer Laborer; Preparation, construction and maintenance of roadbeds and sub-grade for all paving, including excavation, dumping, and spreading of sub-grade material; Prestressed or precast concrete slabs, walls, or sections: all loading, unloading, stockpiling, hooking on of such slabs, walls or sections; Quarry Laborers; Railroad, Streetcar, and Rail Transit Maintenance and Repair; Roustabout; Rubbish Trucks in connection with Building Construction Projects (excluding clearing, grubbing, and excavating); Salvage Yard: All work connected with cutting, cleaning, storing, stockpiling or handling of materials, all cleanup, removal of debris, burning, back-filling and landscaping of the site; Sandblasting Tender (Pot Tender): Hoses and pots or markers; Scaffolds: Erection, planking and removal of all scaffolds used for support for lathers, plasters, brick layers, masons, and other construction trades crafts; Scaffolds: (Specially designed by carpenters) laborers shall tend said carpenter on erection and dismantling thereof, preparation for foundation or mudsills, maintenance; Scraping of floors; Screeds: Handling of all screeds to be reused; handling, dismantling and conveyance of screeds; Setting, leveling and securing or bracing of metal or other road forms and expansion joints; Sheeting Piling/trench shoring (handling and placing of skip sheet or wood plank trench shoring); Ship Scalers; Shipwright Tender; Sign Erector (subdivision traffic, regulatory, and street-name signs); Sloper; Slurry Seal Crews (Mixer Operator, Applicator, Squeegee Man, Shuttle Man, Top Man); Snapping of wall ties and removal of tie rods; Soil Test operations of semi and unskilled labor such as filling sand bags; Striper (Asphalt, Concrete or other Paved Surfaces); Tool Room Attendant (Job Site); Traffic Delineating Device Applicator; Underpinning, lagging, bracing, propping and shoring, loading, signaling,

right-of-way clearance along the route of movement, The clearance of new site, excavation of foundation when moving a house or structure from old site to new site; Utilities employees; Water Man; Waterscape/Hardscape Laborers; Wire Mesh Pulling (all concrete pouring operations); Wrecking, stripping, dismantling and handling concrete forms an false work.

LABO0368-002 09/01/2020

	Rates	Fringes
Landscape & Irrigation Laborers		
GROUP 1	$ 26.40	14.25
GROUP 2	$ 27.40	14.25
GROUP 3	$ 21.70	14.25

LABORERS CLASSIFICATIONS

GROUP 1: Installation of non-potable permanent or temporary irrigation water systems performed for the purposes of Landscaping and Irrigation architectural horticultural work; the installation of drinking fountains and permanent or temporary irrigation systems using potable water for Landscaping and Irrigation architectural horticultural purposes only. This work includes (a) the installation of all heads, risers, valves, valve boxes, vacuum breakers (pressure and non-pressure), low voltage electrical lines and, provided such work involves electrical wiring that will carry 24 volts or less, the installation of sensors, master control panels, display boards, junction boxes, conductors, including all other components for controllers, (b) and metallic (copper, brass, galvanized, or similar) pipe, as well as PVC or other plastic pipe including all work incidental thereto, i.e., unloading, handling and distribution of all pipes fittings, tools, materials and equipment, (c) all soldering work in connection with the above whether done by torch, soldering iron, or other means; (d) tie-in to main lines, thrust blocks (both precast and poured in place), pipe hangers and supports incidental to installation of the entire irrigation system, (e) making of pressure tests, start-up testing, flushing, purging, water balancing, placing into operation all irrigation equipment, fixtures and appurtenances installed under this agreement, and (f) the fabrication, replacement, repair and servicing oflandscaping and irrigation systems. Operation of hand-held gas, air, electric, or self-powered tools and equipment used in the performance of Landscape and Irrigation work in connection with architectural horticulture; Choke-setting, signaling, and rigging for equipment operators on job-site in the performance of such Landscaping and Irrigation work; Concrete work (wet or dry) performed in connection with such Landscaping and Irrigation work. This work shall also include the setting of rock, stone, or riprap in connection with such Landscape, Waterscape, Rockscape, and Irrigation work; Grubbing, pick and shovel excavation, and hand rolling or tamping in connection with the performance of such Landscaping and Irrigation work; Sprigging, handseeding, and planting of trees, shrubs, ground covers, and other plantings and the performance of all types of gardening and horticultural work relating to said planting; Operation of flat bed trucks (up to and including 2 1/2 tons).:

GROUP 2. Layout of irrigation and other non-potable irrigation water systems and the layout of drinking fountains and other potable irrigation water systems in connection with such Landscaping and Irrigation work. This includes the layout of all heads, risers, valves, valve boxes, vacuum breakers, low voltage electrical lines, hydraulic and electrical controllers, and metallic (coppers, brass, galvanized, or similar) pipe, as well as PVC or other plastic pipe. This work also includes the reading and interpretation of plans and specifications in connection with the layout of Landscaping, Rockscape, Waterscape, and Irrigation work; Operation of Hydro-Mulching machines (sprayman and driver), Drillers, Trenchers (riding type, Davis T-66, and similar) and fork lifts used in connection with the performance of such Landscaping and Irrigation work; Tree climbers and chain saw tree trimmers, Sporadic operation (when used in connection with Landscaping, Rockscape, Waterscape, and Irrigation work) of Skid-Steer Loaders (Bobcat and similar), Cranes (Bantam, Grove, and similar), Hoptos, Backhoes, Loaders, Rollers, and Dozers (Case, John Deere, and similar), Water Trucks, Trucks requiring a State of Hawaii Public Utilities Commission Type 5 and/or type 7 license, sit-down type and ""gang"" mowers, and other self-propelled, sit-down operated machines not listed under Landscape & Irrigation Maintenance Laborer; Chemical spraying using self-propelled power spraying equipment (200 gallon capacity or more).

GROUP 3: Maintenance of trees, shrubs, ground covers, lawns and other planted areas, including the replanting of trees, shrubs, ground covers, and other plantings that did not ""take"" or which are damaged; provided, however, that re-planting that requires the use of equipment, machinery, or power tools shall be paid for at the rate of pay specified under Landscape and Irrigation Laborer, Group 1; Raking, mowing, trimming, and runing, including the use of ""weed eaters"", hedge trimmers, vacuums, blowers, and other hand-held gas, air, electric, or self-powered tools, and the operation of lawn mowers (Note: The operation of sit-down type and ""gang"" mowers shall be paid for at the rate of pay specified under Landscape & Irrigation Laborer, Group 2); Guywiring, staking, propping, and supporting trees; Fertilizing, Chemical spraying using spray equipment with less than 200 gallon capacity, Maintaining irrigation and sprinkler systems, including the staking, clamping, and adjustment of risers, and the adjustment and/or replacement of sprinkler heads, (Note: the cleaning and gluing of pipe and fittings shall be paid for at the rate of pay specified under Landscape & Irrigation Laborer(Group 1); Watering by hand or sprinkler system and the peformance of other types of gardening, yardman, and horticultural-related work.

LABO0368-003 09/02/2020

	Rates	Fringes
Underground Laborer		
GROUP 1	$ 39.30	22.68
GROUP 2	$ 40.80	22.68
GROUP 3	$ 41.30	22.68
GROUP 4	$ 42.30	22.68
GROUP 5	$ 42.65	22.68

GROUP 6.....$ 42.90 22.68
GROUP 7.....$ 43.35 22.68

GROUP 1: Watchmen; Change House Attendant.

GROUP 2: Swamper; Brakeman; Bull Gang-Muckers, Trackmen; Dumpmen (any method); Concrete Crew (includes rodding and spreading); Grout Crew; Reboundmen

GROUP 3: Chucktenders and Cabletenders; Powderman (Prime House); Vibratorman, Pavement Breakers

GROUP 4: Miners - Tunnel (including top and bottom man on shaft and raise work); Timberman, Retimberman (wood or steel or substitute materials thereof); Blasters, Drillers, Powderman (in heading); Microtunnel Laborer; Headman; Cherry Pickerman (where car is lifted); Nipper; Grout Gunmen; Grout Pumpman & Potman; Gunite, Shotcrete Gunmen & Potmen; Concrete Finisher (in tunnel); Concrete Screed Man; Bit Grinder; Steel Form Raisers & Setters; High Pressure Nozzleman; Nozzleman (on slick line); Sandblaster-Potman (combination work assignment interchangeable); Tugger

GROUP 5: Shaft Work & Raise (below actual or excavated ground level); Diamond Driller; Gunite or Shotcrete Nozzleman; Rodman; Groundman

GROUP 6: Shifter

GROUP 7: Shifter (Shaft Work & Raiser)

PAIN1791-001 07/01/2021

	Rates	Fringes
Painters:		
Brush	$ 38.90	30.09
Sandblaster; Spray	$ 38.90	30.09

PAIN1889-001 07/01/2021

	Rates	Fringes
Glaziers	$ 40.50	36.18

PAIN1926-001 02/28/2021

	Rates	Fringes
Soft Floor Layers	$ 37.77	32.07

PAIN1944-001 01/05/2020

	Rates	Fringes
Taper	$ 43.10	29.90

PLAS0630-001 08/30/2021

	Rates	Fringes
PLASTERER	$ 44.21	32.83

PLAS0630-002 08/31/2020

	Rates	Fringes
Cement Masons:		
Cement Masons	$ 42.65	32.29
Trowel Machine Operators	$ 42.80	32.29

PLUM0675-001 07/04/2021

	Rates	Fringes
Plumber, Pipefitter, Steamfitter & Sprinkler Fitter	$ 48.63	28.40

* ROOF0221-001 09/05/2021

	Rates	Fringes
Roofers (Including Built Up, Composition and Single Ply)	$ 42.55	20.78

SHEE0293-001 09/02/2018

	Rates	Fringes
Sheet metal worker	$ 42.55	27.44

SUHI1997-002 09/15/1997

	Rates	Fringes
Drapery Installer	$ 13.60	1.20
FENCE ERECTOR (Chain Link Fence)	$ 9.33	1.65

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of ""identifiers"" that indicate whether the particular rate is a union rate (current union negotiated rate for local), a survey rate (weighted average rate) or a union average rate (weighted union average rate).

Union Rate Identifiers

A four letter classification abbreviation identifier enclosed in dotted lines beginning with characters other than ""SU"" or ""UAVG"" denotes that the union classification and rate were prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2014. PLUM is an abbreviation identifier of the union which prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. 07/01/2014 is the effective date of the most current negotiated rate, which in this example is July 1, 2014.

Union prevailing wage rates are updated to reflect all rate changes in the collective bargaining agreement (CBA) governing this classification and rate.

Survey Rate Identifiers

Classifications listed under the ""SU"" identifier indicate that no one rate prevailed for this classification in the survey and the published rate is derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As this weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SULA2012-007 5/13/2014. SU indicates the rates are survey rates based on a weighted average calculation of rates and are not majority rates. LA indicates the State of Louisiana. 2012 is the year of survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. 5/13/2014 indicates the survey completion date for the classifications and rates under that identifier.

Survey wage rates are not updated and remain in effect until a new survey is conducted.

Union Average Rate Identifiers

Classification(s) listed under the UAVG identifier indicate that no single majority rate prevailed for those classifications; however, 100% of the data reported for the classifications was union data. EXAMPLE: UAVG-OH-0010 08/29/2014. UAVG indicates that the rate is a weighted union average rate. OH indicates the state. The next number, 0010 in the example, is an internal number used in producing the wage determination. 08/29/2014 indicates the survey completion date for the classifications and rates under that identifier.

A UAVG rate will be updated once a year, usually in January of each year, to reflect a weighted average of the current negotiated/CBA rate of the union locals from which the rate is based.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISION"

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
201.1000	Clearing and Grubbing	5100	S.Y.	$ _____	$ _____
202.1000	Removal of Existing Grade Beams and Piles	F.A.	F.A.	F.A.	$300,000.00
203.1000	Roadway Excavation	1100	C.Y.	$ _____	$ _____
203.2000	Imported Borrow	5500	C.Y.	$ _____	$ _____
203.9000	Potholing and Location of Obstructions	F.A.	F.A.	F.A.	$300,000.00
203.9400	Load Transfer Platform For Abutment No. 1	L.S.	L.S.	L.S.	$ _____
203.9500	Load Transfer Platform No. 1	L.S.	L.S.	L.S.	$ _____
203.9600	Load Transfer Platform No. 2	L.S.	L.S.	L.S.	$ _____
203.9700	Load Transfer Platform No. 3	L.S.	L.S.	L.S.	$ _____
203.9800	Load Transfer Platform No. 4	L.S.	L.S.	L.S.	$ _____
203.9900	Load Transfer Platform No. 5	L.S.	L.S.	L.S.	$ _____
205.1000	Structure Backfill for Lightweight Cellular Concrete Fill	2603	C.Y.	$ _____	$ _____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
209.1000	Installation, Maintenance, Monitoring, and Removal of BMP	L.S.	L.S.	L.S.	$ _____
209.1100	Additional Water Pollution, Dust, and Erosion Control	F.A.	F.A.	F.A.	$88,000.00
304.1000	Aggregate Base	350	C.Y.	$ _____	$ _____
503.0000	Concrete for Skeg Walls and Retaining Walls B, D, E, F, G, H, J, and K	400	C.Y.	$ _____	$ _____
503.1000	Concrete for Planter Walls	86	C.Y.	$ _____	$ _____
503.2000	Concrete for Foundation Slabs	567	C.Y.	$ _____	$ _____
503.3000	Concrete for Drilled Shaft Cap Beam and Barriers	25	C.Y.	$ _____	$ _____
503.4000	Concrete for Pier	37	C.Y.	$ _____	$ _____
503.5000	Concrete for Abutments	130	C.Y.	$ _____	$ _____
503.6000	Concrete for End Beams, Corbels, and Pier Diaphragm	16	C.Y.	$ _____	$ _____
503.7000	Concrete for Deck Topping and Edge Beams	70	C.Y.	$ _____	$ _____
503.8000	Concrete for Approach Slabs and Sleeper Slabs	33	C.Y.	$ _____	$ _____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
503.9000	Concrete for Stairs and Curb	26	C.Y.	$ _____	$ _____
504.1000	Prestressed Concrete Planks P-1, P-2, P-3, and P-4	4	EACH	$ _____	$ _____
504.2000	Prestressed Concrete Planks P-5, P-6, P-7, and P-8	4	EACH	$ _____	$ _____
507.1000	Concrete Pedestrian Railing	L.S.	L.S.	L.S.	$ _____
511.1000	Furnishing Drilled Shaft Drilling Equipment	L.S.	L.S.	L.S.	$ _____
511.2000	Obstruction	16	HOURS	$ _____	$ _____
511.3000	Load Test	1	EACH	$ _____	$ _____
511.4100	Unclassified Shaft Excavations (36-inch diameter)	240	L.F.	$ _____	$ _____
511.4200	Unclassified Shaft Excavations (48-inch diameter)	150	L.F.	$ _____	$ _____
511.5100	Drilled Shafts (36-inch diameter)	240	L.F.	$ _____	$ _____
511.5200	Drilled Shafts (48-inch diameter)	150	L.F.	$ _____	$ _____
511.6000	Coring for Integrity Testing for Acceptable Drilled Shaft	140	L.F.	$ _____	$ _____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
602.0000	Reinforcing Steel for Skeg Walls and Retaining Walls B, D, E, F, G, H, J, and K	L.S.	L.S.	L.S.	$ _____
602.1000	Reinforcing Steel for Planter Walls	L.S.	L.S.	L.S.	$ _____
602.2000	Reinforcing Steel for Foundation Slabs	L.S.	L.S.	L.S.	$ _____
602.3000	Reinforcing Steel for Drilled Shaft Cap Beam and Barriers	L.S.	L.S.	L.S.	$ _____
602.4000	Reinforcing Steel for Pier	L.S.	L.S.	L.S.	$ _____
602.5000	Reinforcing Steel for Abutments	L.S.	L.S.	L.S.	$ _____
602.6000	Reinforcing Steel for End Beams, Corbels, and Pier Diaphragm	L.S.	L.S.	L.S.	$ _____
602.7000	Reinforcing Steel for Deck Topping and Edge Beams	L.S.	L.S.	L.S.	$ _____
602.8000	Reinforcing Steel for Approach Slabs and Sleeper Slabs	L.S.	L.S.	L.S.	$ _____
602.9000	Reinforcing Steel for Stairs	L.S.	L.S.	L.S.	$ _____
603.2000	12-inch High Density Polyethylene Pipe, Type S	72	L.F.	$ _____	$ _____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
603.8000	Vertical Drain	6	EACH	$ _____	$ _____
603.9000	Clean Existing Culverts	F.A.	F.A.	F.A.	$25,000.00
604.1300	Grated Drop Inlet	2	EACH	$ _____	$ _____
604.1400	Outlet Structure	1	EACH	$ _____	$ _____
608.1000	Handrail - Wall-Mounted	1060	L.F.	$ _____	$ _____
608.2000	Handrail - Free-Standing	670	L.F.	$ _____	$ _____
616.0001	New Automatic Irrigation System	L.S	L.S	L.S.	$ _____
616.0002	Temporary Above-Grade Irrigation	L.S.	L.S.	L.S.	$ _____
617.0001	Imported Planting Soil - 4" Layer	375	C.Y.	$ _____	$ _____
617.0002	Imported Lightweight Planting Soil - 30" Layer, Min.	800	C.Y.	$ _____	$ _____
617.0003	Imported Compost - 2" Layer	32,951	S.F.	$ _____	$ _____
617.0004	Soil Amendment (Over all planting areas)	32,951	S.F.	$ _____	$ _____
619.0001	Tree - Relocated Monkeypod (*Samanea saman*)	2	EACH	$ _____	$ _____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
619.0002	Tree - Relocated Singapore Plumeria (*Plumeria obtusa*)	3	EACH	$ _____	$ _____
619.0003	Tree - Relocated Coconut Palm (*Cocos nucifera*)	5	EACH	$ _____	$ _____
619.0004	Tree (New Monkeypod (*Samanea saman*) - Field Stock, 8'-0" Clear Trunk Height Min., 12" Caliper Min.)	3	EACH	$ _____	$ _____
619.0005	Tree (New Beach Heliotrope (*Tournefortia argentia*) - Field Stock, 6'-0" to 8'-0" Clear Trunk Height Min.)	5	EACH	$ _____	$ _____
619.0006	Tree (New Coconut Palm (*Cocos nucifera*) - Field Stock, 10'-0" to 25'-0" Brown Trunk Height Min.)	12	EACH	$ _____	$ _____
619.0007	Tree (New Areca Palm (*Dypsis lutescens*) - 30 Gal, 3 Canes Min., Bushy)	3	EACH	$ _____	$ _____
619.0008	Tree (New Loulu Palm (*Pritchardia hillebrandii*) - Field Stock, 6'-0" to 8'-0" Clear Trunk Height Min.)	9	EACH	$ _____	$ _____
619.0009	Tree (New Rhapis Palm (*Rhapis excelsa*) - 10 Gal, 4 Canes Min., Bushy)	6	EACH	$ _____	$ _____
619.0010	Shrub (New Giant Spider Lily (*Crinum amabile*) - 3 Gal, Bushy)	53	EACH	$ _____	$ _____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
619.0011	Shrub (New Queen Emma Spider Lily (*Crinum augustum 'Queen Emma'*) - 3 Gal, Bushy)	61	EACH	$ _____	$ _____
619.0012	Shrub (New Dwarf Hau (*Hibiscus tiliaceus 'Dwarf'*) - 5 Gal @ 4'-0" o.c.)	42	EACH	$ _____	$ _____
619.0013	Shrub (New Tricolor Hau (*Hibiscus tiliaceus 'Tricolor'*) - 15 Gal, Bushy)	11	EACH	$ _____	$ _____
619.0014	Shrub (New Beach Naupaka (*Scaevola taccada*) - 1 Gal @ 3'-0" o.c.)	530	EACH	$ _____	$ _____
619.0015	Groundcover (New Laua'e Fern (*Microsorium grossum*) - 6" Pot @ 1'-0" o.c., Tri. Spacing)	1,400	EACH	$ _____	$ _____
619.0017	Vine (New Pohinahina Groundcover (*Vitex rotundifolia*) - 6" Pots at 1'-0" o.c.	4,500	EACH	$ _____	$ _____
619.0020	Composite Header	L.S.	L.S.	L.S.	$ _____
619.0021	Plastic Root Barrier	960	L.F.	$ _____	$ _____
619.0022	Wood Bark Mulch - 2" Layer	80	C.Y.	$ _____	$ _____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
619.0023	Maintenance Period (9 Months Total)	L.S.	L.S.	L.S.	$ _____
622.0100	Pedestrian Walkway Wall Recessed Light	115	EACH	$ _____	$ _____
622.0200	Remote Driver For Pedestrian Walkway Wall Recessed Light	14	EACH	$ _____	$ _____
622.0300	Pedestrian Walkway Pole Light	10	EACH	$ _____	$ _____
622.0400	Foundation For Pedestrian Walkway Pole Light	10	EACH	$ _____	$ _____
622.0500	Decorative Type "B" Highway Light Standard (Single Arm)	1	EACH	$ _____	$ _____
622.0600	Decorative Type "B" Highway Light Standard (Dual Arm)	1	EACH	$ _____	$ _____
622.0700	Foundation For Decorative Type "B" Highway Light Standard	2	EACH	$ _____	$ _____
622.0800	Remove, Salvage, & Deliver to HDOT Baseyard Existing Decorative Type "B" Highway Light Standard	2	EACH	$ _____	$ _____
622.0900	Relocate Kewalo Basin Street Light	1	EACH	$ _____	$ _____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
622.1000	Foundation For Kewalo Basin Street Light	1	EACH	$ _____	$ _____
622.1100	Demolish Existing Kewalo Basin Street Light Foundation	1	EACH	$ _____	$ _____
622.1200	Demolish Existing Kewalo Basin Street Light & Foundation (Dual Arms & Fixtures)	1	EACH	$ _____	$ _____
622.1300	3/4" Conduit (For Pedestrian Walkway Wall Recessed Lighting)	4000	L.F.	$ _____	$ _____
622.1400	1" Conduit (For Pedestrian Walkway Wall Recessed Lighting)	2000	L.F.	$ _____	$ _____
622.1500	3/4" Conduit (For Pedestrian Walkway Pole Lighting)	150	L.F.	$ _____	$ _____
622.1600	1" Conduit (For Pedestrian Walkway Pole Lighting)	450	L.F.	$ _____	$ _____
622.1700	#10 AWG, RHW-USE Conductor	11500	L.F.	$ _____	$ _____
622.1800	#8 AWG, RHW-USE Conductor	6500	L.F.	$ _____	$ _____
622.1900	#2 AWG, RHW-USE Conductor	3150	L.F.	$ _____	$ _____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
622.2000	Kewalo Basin Lighting 1-2" Ductline, Concrete Encased, Trench & Backfill	30	L.F.	$ _____	$ _____
622.2100	Kewalo Basin Lighting 2-2" Ductline, Concrete Encased, Trench & Backfill	150	L.F.	$ _____	$ _____
622.2200	Highway Lighting 6-1" Ductline, Concrete Encased, Trench & Backfill	50	L.F.	$ _____	$ _____
622.2300	Highway Lighting 1-2" Ductline, Concrete Encased, Trench & Backfill	60	L.F.	$ _____	$ _____
622.2400	Highway Lighting 2-2" Ductline, Concrete Encased, Trench & Backfill	215	L.F.	$ _____	$ _____
622.2500	Highway Lighting 4-2" Ductline, Concrete Encased, Trench & Backfill	85	L.F.	$ _____	$ _____
622.2600	Type "A" Highway Lighting Pullbox	1	EACH	$ _____	$ _____
622.2700	Type "C" Highway Lighting Pullbox	2	EACH	$ _____	$ _____
622.2800	Receptacle, 7-Pin	6	EACH	$ _____	$ _____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
622.2900	LightGrid Node (HDOT Network)	6	EACH	$ _____	$ _____
622.3000	Junction Boxes, 12"Sq x 6" Deep, Nema 4X, Stainless Steel (Pedestrian Walkway Lighting)	15	EACH	$ _____	$ _____
622.3100	Pedestrian Walkway Lighting Control System (Panelboard, Contactors, & Appurtenances)	1	EACH	$ _____	$ _____
622.3200	Pedestrian Walkway Lighting Equipment Cabinet & Foundation	1	EACH	$ _____	$ _____
623.0100	CCTV Cabinet & Foundation (HDOT)	1	EACH	$ _____	$ _____
623.0200	CCTV Cameras (HDOT)	2	EACH	$ _____	$ _____
623.0300	CCTV Camera Cables (HDOT)	500	L.F.	$ _____	$ _____
623.0400	#6 AWG, RHW-USE Conductor	450	L.F.	$ _____	$ _____
623.0500	HDOT Communications (Power) 1-2" Ductline, Concrete Encased, Trench & Backfill	150	L.F.	$ _____	$ _____
623.0600	HDOT Communications 1-2" Ductline, Concrete Encased, Trench & Backfill	425	L.F.	$ _____	$ _____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
623.0700	HDOT Communications 1-4" Ductline, Concrete Encased, Trench & Backfill	200	L.F.	$ _____	$ _____
623.0800	Replace Existing Pullbox With New Type "C" Traffic Signal Pullbox	3	EACH	$ _____	$ _____
623.0900	Traffic Signal 2-2" Ductline, Concrete Encased, Trench & Backfill	50	L.F.	$ _____	$ _____
623.1000	Type 3 Interconnect Cable	1800	L.F.	$ _____	$ _____
623.1100	1.5" Conduit (For Private Security System)	700	L.F.	$ _____	$ _____
623.1200	Private Security System 1-1.5" Ductline, Concrete Encased, Trench & Backfill	20	L.F.	$ _____	$ _____
623.1300	Private Security System Pullbox	4	EACH	$ _____	$ _____
623.1400	Junction Boxes, 4"Sq x 4"Deep, Nema 4X, Stainless Steel (Private Security System)	3	EACH	$ _____	$ _____
628.1000	Shotcrete for Retaining Wall A - Interim Shotcrete Facing	220	S.Y.	$ _____	$ _____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
628.2000	Shotcrete for Retaining Wall A - Permanent Facing (including Sculpted Shotcrete)	200	S.Y.	$ _____	$ _____
628.3000	Shotcrete for Retaining Wall C - Interim Shotcrete Facing	160	S.Y.	$ _____	$ _____
628.4000	Shotcrete for Retaining Wall C - Permanent Facing	130	S.Y.	$ _____	$ _____
631.1000	Regulatory Sign (10 Square Feet or Less) with Post	6	EACH	$ _____	$ _____
631.9000	Additional Miscellaneous Signs	F.A.	F.A.	F.A.	$30,000.00
634.1000	Portland Cement Concrete Sidewalk	1340	S.Y.	$ _____	$ _____
636.1000	E-Construction license	F.A.	F.A.	F.A.	$283,000.00
638.1000	Curb, Type 2D Modified	450	L.F.	$ _____	$ _____
638.3000	Curb and Gutter, Type 2DG Modified	100	L.F.	$ _____	$ _____
641.0001	Hydro-mulch Sprigging	L.S.	L.S.	L.S.	$ _____
645.1000	Traffic Control	L.S.	L.S.	L.S.	$ _____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
645.2000	Additional Police Officers, Additional Traffic Control Devices, And Advertisement	F.A.	F.A.	F.A.	$250,000.00
647.0100	Fiber Optic Cable, 24 Strand, Multi Mode (Ward Ave To Kewalo Basin Intersection)	1800	L.F.	$ _____	$ _____
647.0200	Fiber Optic Cable, 72 Strand, Single Mode (Ward Ave To Kewalo Basin Intersection)	1800	L.F.	$ _____	$ _____
647.0300	Backpull Existing 24-Strand Multi-Mode Fiber Optic Cable From Existing CCTV Cabinet At Kamakee Street To New CCTV Cabinet At Kewalo Basin Intersection	1	EACH	$ _____	$ _____
647.0400	Backpull Existing 72-Strand Single Mode Fiber Optic Cable From Existing CCTV Cabinet At Piikoi Street To New CCTV Cabinet At Kewalo Basin Intersection	1	EACH	$ _____	$ _____
648.1000	Field Posted Drawings	L.S.	L.S.	L.S.	$ _____
657.1000	Furnishing Jet Grouting Equipment	L.S.	L.S.	L.S.	$ _____
657.2000	Jet Grout Test Program	L.S.	L.S.	L.S.	$ _____
657.3000	Jet Grout Columns	4600	L.F.	$ _____	$ _____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
658.1000	Archaeological Monitor	F.A.	F.A.	F.A.	$100,000.00
671.1000	Protection of Endangered Species	F.A.	F.A.	F.A.	$25,000.00
680.1000	Surface Treatment for Concrete Walkway	5625	S.F.	$ _____	$ _____
686.1000	GRS for Mauka Abutment	L.S.	L.S.	L.S.	$ _____
686.2000	GRS for Makai Abutment	L.S.	L.S.	L.S.	$ _____
686.3000	GRS for Retaining Wall A	L.S.	L.S.	L.S.	$ _____
686.4000	GRS for Retaining Wall C	L.S.	L.S.	L.S.	$ _____
693.0500	Terminal Impact Attenuator (Quadguard M10 or Approved Equal)	2	EACH	$ _____	$ _____
693.0600	Replacement Diaphragm Assembly, Fender Panel Assembly, and Cartridge Cells	2	EACH	$ _____	$ _____
693.0700	Replacement Nose Assembly and Cartridge Cells	2	EACH	$ _____	$ _____
693.0800	Replacement Unit	2	EACH	$ _____	$ _____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
696.1000	Field Office Trailer (Not to Exceed $32,000.00)	L.S.	L.S.	L.S.	$ _____
696.2000	Maintenance of Trailers	F.A.	F.A.	F.A.	$50,000.00
699.1000	Mobilization (Not to Exceed 6 Percent of the Sum of All Items Excluding the Bid Price of this Item)	L.S.	L.S.	L.S.	$ _____
	Sum of all Items ……....				$ _____

NOTES:
1. Bidders must complete all unit prices and amounts. Failure to do so may be grounds for rejection of bid.
2. Bids shall include all Federal, State, County and other applicable taxes and fees.
3. The Sum of all Items will be used to determine the lowest responsible bidder.
4. If a discrepancy occurs between unit bid price and the bid price, the unit bid price shall govern.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

Project: ALA MOANA BOULEVARD ELEVATED PEDESTRIAN WALKWAY
FEDERAL AID PROJECT NO. BLD-092-1(029)

The following RFIs/questions were submitted via HIePRO by prospective bidders prior to August 27, 2021 and were not addressed in Addendum No.1. The questions and responses are as follows:

11. 622.2900 - Please confirm that the cost to integrated the new LightGrid nodes into the existing LightGrid node system will be covered by the State and not the contractor.?

    Response*: *Networking costs to add new LightGrid nodes onto HDOT Highways LightGrid Management System will be covered by the State.

The following additional RFIs/questions were submitted via HIePRO by prospective bidders as of September 7, 2021. The questions and responses are as follows:

56. Specification 601 Structural Concrete specifies a shrinkage strain value of 0.00006 at 28 days and 0.000146 at 56 days. Currently there are no local private testing labs that can measure concrete shrinkage strain. Industry standard for determining concrete shrinkage has typically been per ASTM C157/157M as a percentage value (example: 0.0045%). My question is: 1. Will the design team change the shrinkage strain requirements to reflect as indicated in ASTM C157/157M?

    Response: Per Addendum No. 1, this requirement was removed from the specifications.

57. Part 1 of 2 Regarding the SECTION 511 - DRILLED SHAFTS and SECTION 601 - STRUCTURAL CONCRETE for the Ala Moana Boulevard Elevated Pedestrian Walkway - BLD-092-1(029 project at Honolulu, Oahu, Hawaii. SECTION 601 - STRUCTURAL CONCRETE, subsection 601.01 – Description states “This section describes structural concrete consisting of Portland Cement, fine aggregate, coarse aggregate, and water. This will include adding admixtures for the purpose of entraining air, retarding or accelerating set, tinting, and other purposes as required or permitted. To reduce the embodied carbon footprint of concrete, concrete design on the island of Oahu shall include the use of carbon dioxide mineralization or equivalent technology. Other methods to reduce the cement content such as use of supplementary cementitious materials (SCMs) or admixtures such as C-S-H nanoparticle-based strength-enhancing admixture (CSH-SEA) or equivalent may also be used to reduce the embodied carbon footprint including the combination thereof the previously mentioned methods.”

    Response: See response to RFI 58.

58. Part 2 of 2 to Question No. 57 As mentioned in another RFI for this project, only one supplier of concrete in the State of Hawaii has the equipment to use carbon dioxide mineralization. This limits the concrete supply and pricing to a single source. Hawaiian Cement is currently installing this technology, but cannot offer this technology at this time. Other methods to reduce the cement content and reduce the embodied carbon footprint of concrete, including fly ash (SCMs) can offer a greater carbon reduction (100+ pounds / CY vs 27 pounds for carbon mineralization). However, they do not reduce the cementitious content of the concrete. The very low cementitious content limits on the S0.3 drawing is a concern. These limits are well below the standard cementitious content of our DOT mixes and are below our modified mixes with HRWR with subsequently lower water and cementitious content. These concerns are intensified by the required admixture package including SRA and multiple macro fibers. We are concerned these mixes will be too volatile to deliver to the downtown location with the heavy traffic we encounter. These low cementitious mixes maybe suitable for the mainland, with their naturally rounded and less textured granite or limestone aggregates, but our local basalt is highly textured and angular which drives up the water demand and subsequent cementitious content. The low cementitious values could be influenced by the assumed use of carbon mineralization, but again this is only offer by one supplier. Will the owner / design professionals take into account the use of supplementary cementitious materials (SCMs, like fly ash) and increase the maximum cementitious content of concrete indicated on the S.O3 drawing?

Response: The low cementitious content limits specified on Sheet S0.3 are based on many previous DOT projects that have been successfully completed with no issues. The cementitious material content limit will not be changed for this project.

The use of SCM's will be considered as "equivalent technology" to carbon dioxide mineralization. Ready mix supplier should be aware that the term "cementitious material" as stated on sheet S0.3 and within the specifications is defined as not just Portland cement but rather the total combination of Portland cement and any blended SCM's to the mix.

59. Part 1 of 2 Regarding the SECTION 601 – STRUCTURAL CONCRETE for the Ala Moana Boulevard Elevated Pedestrian Walkway - BLD-092-1(029 project at Honolulu, Oahu, Hawaii. The 2020 revision of the Hawaii Department of Transportation's SECTION 601 - STRUCTURAL CONCRETE, subsection 601.01 – Description states "This section describes structural concrete consisting of Portland Cement, fine aggregate, coarse aggregate, and water. This will include adding admixtures for the purpose of entraining air, retarding or accelerating set, tinting, and other purposes as required or permitted. To reduce the embodied carbon footprint of concrete, concrete design on the island of Oahu shall include the use of carbon dioxide mineralization or equivalent technology. Other methods to reduce the cement content such as use of supplementary cementitious materials (SCMs) or admixtures such as C-S-H nanoparticle-based strength-enhancing admixture (CSH-SEA) or equivalent may also be used to reduce the embodied carbon footprint including the combination thereof the previously mentioned methods." The local

concrete industry asked the DOT at the time of this update, to add the alternate methods to reduce the embodied carbon footprint of concrete. Currently, only one supplier of concrete in the State of Hawaii has the equipment to use carbon dioxide mineralization. This limits the concrete supply and pricing to a single source. Hawaiian Cement is currently installing this technology, but cannot offer this technology at this time.

Response: See response to RFI 60.

60. Part 2 of 2 to Question No. 59 Hawaiian Cement can offer other methods to reduce the cement content and reduce the embodied carbon footprint of concrete, including fly ash (SCMs) or admixtures such as CS-H nanoparticle-based strength-enhancing admixture (CSH-SEA). Why should the use of fly ash be approved for this project? Fly Ash help with: 1) sustainability – replaces portland cement by using recyclable material and assists in meeting LEED credits, 2) durability - lowers the concrete's permeability to chlorides and other harmful chemicals, 3) lowers the shrinkage of the concrete, 4) lowers the heat of hydration and the risk of thermal cracking, 5) increases the paste volume and subsequently the workability of the concrete, 6) increases the strength of the concrete by increasing the C-SH content. The C-S-H nanoparticle-based strength-enhancing admixture (CSH-SEA – like MBS XSeed-55), allows the reduction of portland cement and increases the strength of the concrete by introducing C-S-H nanoparticles that act as nucleation sites for hydration and subsequently increasing the C-S-H content. Will the owner / design professionals accept the use of supplementary cementitious materials (SCMs, like fly ash) or admixtures such as C-S-H nanoparticle-based strength-enhancing admixture (CSH-SEA – like MBS X-Seed-55), as an equivalent technology to carbon dioxide mineralization to reduce the embodied carbon footprint and cement content of concrete as outlined in the revised SECTION 601 - STRUCTURAL CONCRETE?.

Response: The use of SCM's or strength enhancing admixtures (CSH-SEA) will be considered as equivalent technology to carbon mineralization for this project.

61. Part 1 of 3 Regarding the SECTION 511 - DRILLED SHAFTS for the Ala Moana Boulevard Elevated Pedestrian Walkway - BLD-092-1(029 project at Honolulu, Oahu, Hawaii. SECTION 511 - DRILLED SHAFTS, subsections 511.02 Materials states "The in-place concrete density shall not be less than 3 pounds per cubic foot below the theoretical mix design density. . . . The concrete shall have an air content of 7 (+/-) 1.5 percent. The air entrainment admixture (AEA) shall not be a surfactant or a synthetic detergent. The AEA shall be formulated with polymers that are chemically stable and inert." Although many DOD and a few other agency projects and have been completed using air entrained concrete, slump loss due to extended delivery time, pump placement and consolidation has made finishing difficult. Furthermore, the "polymer" AEA is only available from a single source which current has an exclusive supply agreement with only one Oahu concrete producer, which limits your options for bidders.

Response: See response to RFI 63.

62. Part 2 of 3 to Question No. 61 Hawaiian Cement worked with DOD (COE and NavFac) and local structural engineers to remove air entrainment (AE) from the cast-in-place concrete for building, curb, pavement and sidewalk projects in Hawaii with exception of DOD airfield pavements. Project with AE removed included: Combined Arms Collective Training Facility (Kahuku), TEMF (Helemano), TEMF (Schofield), Warriors in Transition (Schofield), Grow the Army (Schofield), Repair Wharf S1 (Pearl), NOAA Ops (Ford Island) to name a few. We would like to request the same for this and future projects. Air entrainment is primarily used for freeze-thaw protection (ACI 302.1R-96 "Guide for Concrete Floor and Slab Construction", Section 5.6.1 Air-entraining admixtures), which is not an issue in Hawaii. The other positive side-effects of AE, water reduction and workability, are already achieved with less volatile methods including use of water reducer and optimized combined aggregate gradation. The downside of air entrainment is: - One more property to control. - Controlling air entrainment in mixes containing fly ash (which is often required on airfield pavement) is especially difficult due the traces of activated carbon in the fly ash absorbing the AE admixture. - Potential loss of air entrainment and associated loss of concrete workability (slump) from long travel time, pumping, placing, vibrating and finishing concrete (PCA "Design and Control of Concrete Mixtures" Table 8.5). - Air entrained concrete is stickier and more difficult to finish. - Air Entrained concrete has a greater risk of surface defects including blisters and delamination. For these reason, air entrained concrete is not recommended by ACI for trowel finished floors (ACI 302.1R-96 section 5.6.1 and 11.7). - Air Entrained concrete requires a higher cement content for the same strength, which increases cost, increases the carbon footprint, increases the embodied energy and is therefore less sustainable.

Response: See response to RFI 63.

63. Part 3 of 3 to Question No. 61 My questions are: Will the owners / design professionals waive the requirement for air entrainment since there is no risk of freeze thaw damage for this project? If air content will not be waived, will the owners / design professionals waive the requirement for a "polymer" based air entrainment admixture, since there is only one Oahu concrete supplier with this product? If air content will not be waived, will the owners / design professionals waive the requirement for "the in-place concrete density shall not be less than 3 pounds per cubic foot below the theoretical mix design density", since a 1.5" change in air content can cause a variation of 2- 3 pcf and no variance is allowed for the variation in aggregate specific gravities?

Response: Air entrainment admixture criteria removed from Section 511 of the project specifications. See Addendum No. 2.

64. Part 1 of 2 Regarding the SECTION 601 - STRUCTURAL CONCRETE and the use of the requirement for the glass fibers for the Ala Moana Boulevard Elevated Pedestrian Walkway - BLD-092-1(029 project at Honolulu, Oahu, Hawaii.. Fibers have been used in construction materials like concrete and plaster for centuries. In general, fibers can reduce plastic shrinkage cracking, settlement cracking, early drying shrinkage cracking, permeability & bleed rate. In addition, fibers can improved

impact & abrasion resistance, increased toughness, improved durability, and enhanced fatigue resistance. However, we have several concerns regarding the use of glass fibers in concrete. - In the past Glass fiber embrittlement due to infiltration of the calcium hydroxide particles and the by-products of cement hydration into fiber bundles. - AR-glass has improved performance but may be too brittle to survive in a ready mix truck with the highly abrasive and angular basalt aggregates in Hawaii. - Glass fibers are not regularly stocked in Hawaii and therefore require ordering extra material to cover higher than expected concrete volumes. - There are several safety concerns with glass fiber: respiratory, eye and skin protection while introducing the fibers into the concrete.

Response: See response to RFI 65.

65. Part 2 of 2 to Question No. 64 Synthetic macro fibers have the same "fiber benefits" mentioned above. In addition, macro fibers can often replace small rebar (number 3 and 4 bar) and steel mesh. These steel products are used as supplementary reinforce to reduce cracking due to shrinkage and thermal effects, which can frequently be handled by structural fibers at an application rate of 7.5# per cubic yard. Ferro Fiber by Forta Corp. has had excellent results controlling cracking and curling in Hawaii. The product has local distributor so extra inventory to cover unexpected increases in concrete volume are generally not a concern. Several studies have shown that macro fibers have been used to extend joint spacing without increasing the number of random cracks, resulting in reduced maintenance cost as well as initial savings due to fewer joints to saw. My Question is: Will the will the owners / design professionals accept the replacement of glass fibers with Forta's Ferro Fiber (macro polypropylene fiber)?

Response: The Engineer will not accept the replacement of glass fibers with polypropylene fibers for any of the mix designs. However, the Engineer will accept the use of Forta's 2-1/4" long macro synthetic Ferro Fiber for use in concrete items (6), (8), and (9) as shown on Sheet S0.3 (ADD. 117).

66. Will the owners / design professionals waive the requirement for air entrainment since there is no risk of freeze thaw damage for this project

Response: Air entrainment admixture criteria removed from Section 511 of the project specifications. See Addendum No. 2.

67. .If air content will not be waived, will the owners / design professionals waive the requirement for a "polymer" based air entrainment admixture, since there is only one Oahu concrete supplier with this product?

Response: See response to RFI 66.

68. If air content will not be waived, will the owners / design professionals waive the requirement for “the in-place concrete density shall not be less than 3 pounds per cubic foot below the theoretical mix design density”, since a 1.5” change in air content can cause a variation of 2- 3 pcf and no variance is allowed for the variation in aggregate specific gravities?

Response: See response to RFI 66. In-place concrete density requirement will remain.

69. SECTION 511 - DRILLED SHAFTS, subsections 511.02 Materials states “The in-place concrete density shall not be less than 3 pounds per cubic foot below the theoretical mix design density. . . . The concrete shall have an air content of 7 (+/-) 1.5 percent. The air entrainment admixture (AEA) shall not be a surfactant or a synthetic detergent. The AEA shall be formulated with polymers that are chemically stable and inert.” Although many DOD and a few other agency projects and have been completed using air entrained concrete, slump loss due to extended delivery time, pump placement and consolidation has made finishing difficult. Furthermore, the “polymer” AEA is only available from a single source which current has an exclusive supply agreement with only one Oahu concrete producer, which limits your options for bidders. Hawaiian Cement worked with DOD (COE and NavFac) and local structural engineers to remove air entrainment (AE) from the cast-in-place concrete for building, curb, pavement and sidewalk projects in Hawaii with exception of DOD airfield pavements. Project with AE removed included: Combined Arms Collective Training Facility (Kahuku), TEMF (Helemano), TEMF (Schofield), Warriors in Transition (Schofield), Grow the Army (Schofield), Repair Wharf S1 (Pearl), NOAA Ops (Ford Island) to name a few. We would like to request the same for this and future projects. (Con't)

Response: See RFI 70 response.

70. (con't above #69) Air entrainment is primarily used for freeze-thaw protection (ACI 302.1R-96 “Guide for Concrete Floor and Slab Construction”, Section 5.6.1 Air-entraining admixtures), which is not an issue in Hawaii. The other positive side-effects of AE, water reduction and workability, are already achieved with less volatile methods including use of water reducer and optimized combined aggregate gradation. The downside of air entrainment is:

- One more property to control.
- Controlling air entrainment in mixes containing fly ash (which is often required on airfield pavement) is especially difficult due the traces of activated carbon in the fly ash absorbing the AE admixture.
- Potential loss of air entrainment and associated loss of concrete workability (slump) from long travel time, pumping, placing, vibrating and finishing concrete (PCA “Design and Control of Concrete Mixtures” Table 8.5).
- Air entrained concrete is stickier and more difficult to finish.
- Air Entrained concrete has a greater risk of surface defects including blisters and delamination. For these reason, air entrained concrete is not

recommended by ACI for trowel finished floors (ACI 302.1R-96 section 5.6.1 and 11.7).

- Air Entrained concrete requires a higher cement content for the same strength, which increases cost, increases the carbon footprint, increases the embodied energy and is therefore less sustainable.

Response: Air entrainment admixture criteria removed from Section 511 of the project specifications. See Addendum No. 2.

71. SECTION 511 - DRILLED SHAFTS and SECTION 601 - STRUCTURAL CONCRETE for the Ala Moana Boulevard Elevated Pedestrian Walkway - BLD-092-1(029 project at Honolulu, Oahu, Hawaii. SECTION 601 - STRUCTURAL CONCRETE, subsection 601.01 – Description states “This section describes structural concrete consisting of Portland Cement, fine aggregate, coarse aggregate, and water. This will include adding admixtures for the purpose of entraining air, retarding or accelerating set, tinting, and other purposes as required or permitted. To reduce the embodied carbon footprint of concrete, concrete design on the island of Oahu shall include the use of carbon dioxide mineralization or equivalent technology. Other methods to reduce the cement content such as use of supplementary cementitious materials (SCMs) or admixtures such as C-S-H nanoparticle-based strength-enhancing admixture (CSH-SEA) or equivalent may also be used to reduce the embodied carbon footprint including the combination thereof the previously mentioned methods.”As mentioned in another RFI for this project, only one supplier of concrete in the State of Hawaii has the equipment to use carbon dioxide mineralization. (con't)

Response: See response to RFI 58.

72. (con't above #71) This limits the concrete supply and pricing to a single source. Hawaiian Cement is currently installing this technology, but cannot offer this technology at this time.Other methods to reduce the cement content and reduce the embodied carbon footprint of concrete, including fly ash (SCMs) can offer a greater carbon reduction (100+ pounds / CY vs 27 pounds for carbon mineralization). However, they do not reduce the cementitious content of the concrete. The very low cementitious content limits on the S0.3 drawing is a concern. These limits are well below the standard cementitious content of our DOT mixes and are below our modified mixes with HRWR with subsequently lower water and cementitious content. These concerns are intensified by the required admixture package including SRA and multiple macro fibers. We are concerned these mixes will be too volatile to deliver to the downtown location with the heavy traffic we encounter. (con't)

Response: See response to RFI 58.

73. (Con't above #71) These low cementitious mixes maybe suitable for the mainland, with their naturally rounded and less textured granite or limestone aggregates, but our local basalt is highly textured and angular which drives up the water demand and subsequent cementitious content. The low cementitious values could be influenced by the assumed use of carbon mineralization, but again this is only offer by one

supplier. Will the owner / design professionals take into account the use of supplementary cementitious materials (SCMs, like fly ash) and increase the maximum cementitious content of concrete indicated on the S.O3 drawing?

Response: See response to RFI 58.

74. SECTION 601 - STRUCTURAL CONCRETE and the use of the requirement for the glass fibers for the Ala Moana Boulevard Elevated Pedestrian Walkway - BLD-092-1(029 project at Honolulu, Oahu, Hawaii.. Fibers have been used in construction materials like concrete and plaster for centuries. In general, fibers can reduce plastic shrinkage cracking, settlement cracking, early drying shrinkage cracking, permeability & bleed rate. In addition, fibers can improved impact & abrasion resistance, increased toughness, improved durability, and enhanced fatigue resistance. However, we have several concerns regarding the use of glass fibers in concrete.

- In the past Glass fiber embrittlement due to infiltration of the calcium hydroxide particles and the by-products of cement hydration into fiber bundles.
- AR-glass has improved performance but may be too brittle to survive in a ready mix truck with the highly abrasive and angular basalt aggregates in Hawaii.
- Glass fibers are not regularly stocked in Hawaii and therefore require ordering extra material to cover higher than expected concrete volumes.
- There are several safety concerns with glass fiber: respiratory, eye and skin protection while introducing the fibers into the concrete. (con't)

Response: See response to RFI 65.

75. (con't #74 above) Synthetic macro fibers have the same “fiber benefits” mentioned above. In addition, macro fibers can often replace small rebar (number 3 and 4 bar) and steel mesh. These steel products are used as supplementary reinforce to reduce cracking due to shrinkage and thermal effects, which can frequently be handled by structural fibers at an application rate of 7.5# per cubic yard. Ferro Fiber by Forta Corp. has had excellent results controlling cracking and curling in Hawaii. The product has local distributor so extra inventory to cover unexpected increases in concrete volume are generally not a concern. Several studies have shown that macro fibers have been used to extend joint spacing without increasing the number of random cracks, resulting in reduced maintenance cost as well as initial savings due to fewer joints to saw. My Question is: Will the will the owners / design professionals accept the replacement of glass fibers with Forta’s Ferro Fiber (macro polypropylene fiber)?

Response: See response to RFI 65.

76. SECTION 601 - STRUCTURAL CONCRETE for the Ala Moana Boulevard Elevated Pedestrian Walkway - BLD-092-1(029 project at Honolulu, Oahu, Hawaii The 2020 revision of the Hawaii Department of Transportation's SECTION 601 - STRUCTURAL CONCRETE, subsection 601.01 – Description states "This section describes structural concrete consisting of Portland Cement, fine aggregate, coarse aggregate, and water. This will include adding admixtures for the purpose of entraining air, retarding or accelerating set, tinting, and other purposes as required or permitted. To reduce the embodied carbon footprint of concrete, concrete design on the island of Oahu shall include the use of carbon dioxide mineralization or equivalent technology. Other methods to reduce the cement content such as use of supplementary cementitious materials (SCMs) or admixtures such as C-S-H nanoparticle-based strength-enhancing admixture (CSH-SEA) or equivalent may also be used to reduce the embodied carbon footprint including the combination thereof the previously mentioned methods." The local concrete industry asked the DOT at the time of this update, to add the alternate methods to reduce the embodied carbon footprint of concrete. Currently, only one supplier of concrete in the State of Hawaii has the equipment to use carbon dioxide mineralization. (Con't)

Response: See response to RFI 60.

77. (con't #76 above) This limits the concrete supply and pricing to a single source. Hawaiian Cement is currently installing this technology, but cannot offer this technology at this time. Hawaiian Cement can offer other methods to reduce the cement content and reduce the embodied carbon footprint of concrete, including fly ash (SCMs) or admixtures such as C- S-H nanoparticle-based strength-enhancing admixture (CSH-SEA). Why should the use of fly ash be approved for this project? Fly Ash help with: 1) sustainability – replaces portland cement by using recyclable material and assists in meeting LEED credits, 2) durability - lowers the concrete's permeability to chlorides and other harmful chemicals, 3) lowers the shrinkage of the concrete, 4) lowers the heat of hydration and the risk of thermal cracking, 5) increases the paste volume and subsequently the workability of the concrete, 6) increases the strength of the concrete by increasing the C-S- H content. The C-S-H nanoparticle-based strength-enhancing admixture (CSH-SEA – like MBS X- Seed-55), allows the reduction of portland cement and increases the strength of the concrete by introducing C-S-H nanoparticles that act as nucleation sites for hydration and subsequently increasing the C-S-H content. Will the owner / design professionals accept the use of supplementary cementitious materials (SCMs, like fly ash) or admixtures such as C-S-H nanoparticle-based strength-enhancing admixture (CSH-SEA – like MBS X-Seed-55), as an equivalent technology to carbon dioxide mineralization to reduce the embodied carbon footprint and cement content of concrete as outlined in the revised SECTION 601 - STRUCTURAL CONCRETE?

Response: See response to RFI 60.

78. Reference: Bid Item No. 202.1000 Removal of Existing Grade Beams and Piles F.A. Question: Please confirm that demolition / removal of all foundations / Piles of existing substructures shall be paid under the above mentioned FA pay item and bidders shall not allocate cost related to this scope in other bid items.

Response: See revised Special Provision Section 202 in Addendum No. 2.

79. Reference: Lightweight Cellular Concrete Backfill Question: Drawing D-3 (Sheet 63), there is a note reads "Above the Load Transfer Platform, all graded areas shown on this sheet shall be filled with Lightweight Cellular Concrete Backfill up to 30-inches from finish grade" refers to the backfill materials on the Makai side. There is no similar note for the Mauka side, however, drawings S12.1 (sheet 199), S12.2 (sheet 200) and S12.3 (sheet 201) show that there are some areas that require Lightweight Cellular Concrete Backfill on the Mauka side too. Is there lightweight cellular concrete backfill on the Mauka side? If so, could you indicate the extent of the area that needs this Lightweight Cellular Concrete Backfill?

Response: Sheets S6.2, S10.4, S12.1, S12.2, S12.3, S14.12, and S14.13 show all the sections necessary to understand where the Lightweight Cellular Concrete Backfill is being placed on the Mauka side.