STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ADDENDUM NO. 7
FOR

INTERSTATE ROUTE H-3, H-3 FINISH (UNIT VIII)
FEDERAL-AID INTERSTATE PROJECT NO. I-H3-1(75) Unit VIII
AND
INTERSTATE ROUTE H-1 SEISMIC RETROFIT
AUSTIN-BISHOP SEPARATION AND WAIAU INTERCHANGE
FEDERAL-AID INTERSTATE PROJECT NO. BR-H1-1(241)

DISTRICT OF EWA
ISLAND OF OAHU
2003

Amend the bid documents as follows:

1. SPECIAL PROVISIONS

a. Replace Page 105-5a, Dated 10/13/03 with the attached Page 105-5a, Dated 11/1/03.

b. Amend 107.12 Sanitary, Health, And Safety Provisions by adding the following paragraph:

"The Contractor shall be responsible for protecting the sides of the excavations greater than five feet deep from cave-ins. If the Contractor decides to brace or shore the cut slope, the Contractor shall submit working drawings and calculations. The working drawings and calculations shall be stamped by a registered Hawaii Structural Engineer and a registered Civil Engineer specializing in Geotechnical Engineering in the State of Hawaii. If the Contractor decides not to brace the cut slope, the Contractor shall submit calculations, showing the stability of the slope, stamped by a registered Civil Engineer specializing in Geotechnical Engineering in the State of Hawaii. The working drawings and calculations shall be reviewed and accepted by the Engineer before proceeding with the construction."

c. Replace Page 503-41a, Dated r10/16/03 with the attached Page 503-41a, Dated 11/14/03.

d. Replace Pages 511-1a through 511-30a, Dated 10/16/03 with the attached Pages 511-1a through 511-30a, Dated 11/14/03.

e. Replace Page 602-2a, Dated r06/20/03 with the attached Page 602-2a, Dated 11/14/03.

f. Replace Page 624-1a, Dated 3/12/03 with the attached Pages 624-1a through 624-2a, Dated 11/14/03.

g. Amend Subsection 657.01 Description by adding the following sentence to the second paragraph:

"Single, double, and triple fluid methods of jet grouting are acceptable."

h. Replace Pages 658-1a through 658-2a, Dated 3/12/03 with the attached Pages 658-1a through 658-2a, Dated 10/31/03.

2. PROPOSAL SCHEDULE

Replace Pages P-14 through P-44, dated 10/24/03; Page P-45, dated 7/28/00; and Pages P-46 through P-49, dated 8/29/00 with the attached Pages P-14 through P-52, dated 11/13/03.

3. PLANS

a. Amend Plan Sheet No. ADD.228 by revising Note 2 to read as follows:

"Allowable lane closure times on surface streets shall be Monday to Friday, 8:30 A.M. to 3:30 P.M. Exceptions to these hours will be made for major utility service connection work, work in the contract documents that indicate a 24-hour a day lane closure, and other work as approved by the Engineer. The Engineer will solely determine when these additional lane closure hours will be, at no additional cost or extension of contract time."

b. Replace Plan Sheet Nos. 316, 535, 778, and 785 with the attached Plan Sheet Nos. ADD.316, ADD.535, ADD.778, and ADD.785.

c. Replace Plan Sheet Nos., Dated 6/20/03, as indicated in the revision block:

ADD.314, ADD. 315, ADD.450, ADD.458, ADD.471S-1, ADD.472S-1, ADD.491, and ADD.492

with the attached Plan Sheet Nos., Dated 10/31/03, as indicated in the revision block:

ADD.314, ADD. 315, ADD.450, ADD.458, ADD.471S-1, ADD.472S-1, ADD.491, and ADD.492.

d. Replace Plan Sheet Nos., Dated 10/16/03, as indicated in the revision block:

ADD.227 and ADD.563

with the attached Plan Sheet Nos., Dated 10/31/03, as indicated in the revision block:

ADD.227 and ADD.563.

4. APPROVED SUBSTITUTIONS

a. Amend the Approved Substitutions by revising the following approved substitution to read as follows:

No.	Section	Item/Description
4	616	Angle Valve: "VBM Brass Manual Angle Valve" as manufactured by Buckner by Storm, if corrected to provide a separate union.

b. The following items hereinafter listed are approved as equal to the previously specified items, provided all requirements of the contract documents are met. Approval shall not in any circumstances be construed as an approval or deviation from the contract documents unless the entity seeking such approval has, in writing, specifically called to the Engineer's or the approving agency's attention to each such deviation at the time of submission. Said entity and/or Contractor shall be responsible for coordination of the work pertinent to affected materials, equipment and labor to ensure proper execution of the work as per the intent of the contract documents.

No.	Section	Item/Description
6	616	Remote Control Valve: "VBPRA-XX Pressure Regulating Brass Remote Control Valve" as manufactured by Buckner by Storm.
7	616	Remote Control Valve: "DW-PRV Pressure Reducing Solenoid Valve" as manufactured by Griswold Controls.

Please acknowledge receipt of this Addendum No. 7 by writing in "Addendum No. 7 _____" and recording the date of its receipt on page P-4 of the Proposal.

for RODNEY K. HARAGA
Director of Transportation

Nothing herein contained, however, shall excuse the Contractor from compliance with any rules of law precluding any state officers and any Contractors from acting in collusion or bad faith in issuing or performing contract change orders which are clearly not within the scope of the contract."

(XI) Amend **105.19 Value Engineering** by revising the first sentence of the first paragraph to read as follows:

"In accordance with Section 103D-411, HRS, on projects with contract amounts in excess of $250,000 the following Value Engineering Incentive Clauses shall apply, and the Contractor submitting cost reduction proposals, will be allowed to share in those cost savings that ensue from the cost reduction proposals, hereinafter referred to as Value Engineering Change Proposal (VECP)."

(XII) Amend **105.19 Value Engineering** by adding the following paragraph:

"In order to increase work zone safety, the moveable concrete barrier system will not be subject to this Value Engineering provision. This system includes the various pay items of Section 694 – Moveable Concrete Barrier (MCB) and Section 695 – Moveable Concrete Barrier Transfer Machine (MCBTM)."

(XIII) Amend **105.19 Value Engineering** by adding the following paragraphs, which shall apply to a VECP for the Waimalu Viaduct (Westbound):

(I) The terms viaduct, structure, and bridge are considered to be mutually interchangeable herein.

(II) Design conditions. Any Value Engineering Change Proposal for the Waimalu Viaduct shall also meet all of the previous and following conditions in this Section.

(A) Maintain roadway and shoulder widths.

(B) Maintain horizontal and vertical alignments.

(C) Maintain the minimum vertical and horizontal clearances required by the State as follows:

(1) Vertical clearance above a roadway, temporary or permanent, to any part of the bridge structure shall be at least 17-feet.

(2) Horizontal clearance from a roadway, temporary or permanent, to any part of the bridge structure shall be at least 3-feet. This clearance is applicable to structural elements from

The Engineer will pay for the accepted mechanical grooving of the viaduct deck and approach slabs at the contract lump sum price complete in place.

The price includes full compensation for the concrete; for placing, curing and finishing including grooving; for furnishing materials including admixtures and cement (including extra cement added to concrete deposited under water); for furnishing and installing drains, scuppers, premolded joint fillers, joint seals, mud slabs beneath the footings; for furnishing and installing reinforcing steel, structural struts, plates, and straps for water system concrete reaction and test blocks, concrete jacket and reaction beam; for furnishing and installing waterproofing at construction joints, waterstops, pipes, and conduits; for furnishing and installing metal rockers, anchor bolts, structural shapes for expansion joints and other similar items; for timber bumpers, forms, form lining and falsework or centering, bearing pads, structural steel bearing plates; and for equipments, tools, labor, materials, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Mechanical Grooving	Lump Sum
Concrete _____ (Class _____ if applicable)	Lump Sum

The Engineer will pay for reinforcing steel according to Section 602 - Reinforcing Steel.

The Engineer will pay for bearing and expansion plates according to Section 506 - Bearing and Expansion Plates."

END OF SECTION

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 documents. 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 except the concrete shall have minimum 28-day compressive strength f'_c = 4500 psi.

Proportion the concrete mix designs to get properties of high workability, compaction under self weight, and resistance to segregation. The maximum nominal aggregate size shall be 0.75 inch. The slump range shall be 7.0 inches ± 1.0 inch for concrete poured into a water free borehole and 8.0 inches ± 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 not permit superplasticizers.

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

(C) Crosshole Sonic Logging (CSL) Test Access Tubes. CSL access tubes shall conform to the following requirements:

Access tubes shall be a minimum of 2.0-in inside diameter, Standard steel pipe conforming to ASTM A53, Grade B, Type E or S.

Access tubes shall have a round regular inside diameter free of defects and obstructions, including all pipe joints, to permit free passage of the 1.375-inch maximum diameter source and receiver probes used for the testing. Access tubes shall be watertight with watertight couplings, free from corrosion with clean internal and external faces to ensure good bonding between the drilled shaft concrete and the access tubes. Tube ends shall not be damaged and shall be suitably prepared for watertight end caps and coupling. The access tubes shall be close-ended with a watertight cap at the bottom and fitted with removable end caps at the top. Watertight access tube coupling shall be used for extending the tubes.

Access tube acceptance will be based on manufacturer's certification that the furnished material meets the requirements of this specification.

511.03 Qualifications of Drilled Shaft Contractor. The Drilled Shaft Contractor shall be capable of performing the work specified and shall have the following minimum experience requirements below.

(A) 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 five projects completed in the last 10 years on which the Contractor has installed a minimum of five drilled shafts of a diameter and length similar to those shown in the contract. The Drilled Shaft Contractor shall have supervisory personnel at all times during the construction of the drilled shafts who participated in the construction of drilled shafts similar to the type proposed for a duration of at least three years within the last 10 years.

511.04 Pre-Construction Requirements.

(A) Experience Information. The Drilled Shaft Contractor shall submit the following information to the Engineer within 30 days after award of contract:

(1) 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 the Contractor's participation on that project.

(2) Name and experience record of the drilled shaft superintendent in charge of drilled shaft operations for this project. The named superintendent shall remain on the project, unless directed otherwise by the Engineer, until all the drilled shafts are completed including the trial and load test drilled shafts.

(3) A signed statement that the Drilled Shaft Contractor has inspected both the project site and the subsurface information for the project including soil or rock samples made available in the contract documents. Demonstrate an understanding of the subsurface conditions and all factors affecting the drilling operation.

(B) 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 the casing or sheeting or drilling of the shaft.

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

(1) List of all proposed equipment, including the capacities of the equipment, to be used on site including cranes, drills, augers, bailing buckets, final cleaning equipment, tremies or concrete pumps, and casing,

(2) Details of construction operation sequence and the sequence of shaft construction in bents or groups,

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

(4) When the contract requires slurry, details of the methods to mix, circulate, and desand slurry,

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

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

(7) Details of concrete placement including proposed operational procedures for free fall, tremie, or pumping methods, and

(8) Details of required load tests including load cell and test assembly, equipment and procedures, and recent calibrations for jacks or load cells supplied by the Contractor.

The Engineer will evaluate the drilled shaft installation plan for conformance with the contract within 20 days after receipt of the plan. The Engineer will notify the Contractor of additional information required and/or changes necessary to meet the contract requirements. The Engineer will reject parts of the plan that are unacceptable. The

Contractor shall resubmit changes for re-evaluation. 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.

(D) Trial Shaft Installation. Show the adequacy of its methods and equipment by successfully constructing one trial shaft. Position this trial shaft away from production shafts at the location shown in the plans or as modified by the Engineer. Construct the trial drilled shaft to the same diameter as production shafts or as directed by the Engineer. If bells are specified on the plans include a bell in the trial shaft. Install a temporary steel casing and drill the trial shaft to the maximum depth shown on the Plans.

Failure to show the Engineer the adequacy of methods and equipment shall be reason for the Engineer to require alterations in equipment and/or methods by the Contractor. Additional trial shafts required to demonstrate the adequacy of altered methods of construction or equipment shall be at no additional cost to the State. Once the Engineer has given acceptance to construct production shafts, the Engineer will not permit changes in the methods or equipment used to construct the satisfactory trial shaft without consent of the Engineer.

All trial shafts shall be backfilled with unreinforced concrete in the same manner that the production shafts are to be constructed. The Contractor may remove the temporary steel casing following placement of concrete in the trial shaft. All trial shafts shall be cut off 24 inches below finished grade and left in place. Restore the disturbed areas at the site of the trial shaft hole to their original condition. Backfilling of trial shaft not accepted by the Engineer will not be paid for.

(E) Drilled Shaft Load Tests. Load tests shall be performed at the locations 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 tests 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 beam system(s) for monitoring vertical and horizontal deflection of the drilled shaft during testing, supported a minimum distance away from the reference system, (c) materials sufficient to construct and protect the work area, load test equipment, and personnel from inclement weather and sunlight, (d) electric power as required for lights, welding, instruments, etc., and (e) suitable optical survey equipment to measure the horizontal and vertical displacement of shafts during tests 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 with the following exceptions.

(a) Cement Grout. Grout for setting the expandable load cells shall be pumpable and shall have a minimum ultimate 7-day compressive strength of 4,000 psi.

(b) Concrete. Concrete for test shafts shall be batched and handled in accordance with the specifications, except that the Contractor shall supply a mix that will achieve a minimum ultimate 7-day compressive strength of 4,000 psi .

(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 shafts, and strain at indicated locations within the shafts.

The embedment strain gauges shall be positioned along the test shaft at intervals shown on the Plans. 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.

Load cell shall be a flat, hydraulically expandable load cell of a minimum of 34 inches in diameter and capable of applying a load test of at least 2,500 tons 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 0.0001 inch. The load cell shall have been calibrated or certified as accurate to within 1% of the true loads not more that six months prior to installation.

(4) Construction Requirement. The drilled shaft load test shall be a bi-directional load test utilizing 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.

A permanent steel casing shall be installed during the load test shaft installation. The permanent casing for the load test shaft is used to reduce the potential for caving-in of the drilled hole. The permanent casing is also used for the load tests conducted to evaluate the load transfer in a similar manner to the production shafts. The tip elevation of the permanent casing for the load test shafts is shown on the Plans.

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 locations of the load cell prior to installation.

(b) Advance the load test excavation to the maximum depth shown on the plans. A successfully completed trial shaft shall not be used as the load test shaft.

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

(d) Caliper testing shall be performed on the uncased portions of 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 uncased 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.

(f) After the installation of the rebar cage/test equipment assembly, the drilled shaft may be concreted in a similar manner specified for production shafts.

(5) Load Test Schedule. The Contractor shall notify the Engineer of the load testing schedule a minimum of five 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 results prior to providing the production shaft lengths. Load testing of any shaft shall not begin until the concrete has attained a compressive strength of 4,000 psi.

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 50 to 100 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 for precise load increments.

The load test shall be conducted to the maximum test load of 2,500 tons 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 12 hours (near plastic failure) to evaluate the creep effects, or at a load as directed by the Engineer.

(7) Cleanup. After completion of the load test, 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 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 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 D1143-81 including, but not limited to, the following:

(a) Introduction.

(b) Drilled shaft installation procedure.

(c) Load test procedure and instrumentation.

(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.

511.05 Construction Requirement.

(A) Construction Sequence. Complete the excavation to the footing elevations before shaft construction begins. Repair the disturbances caused by shaft installation to the footing area before pouring the footing. The drilled shaft construction sequence shall be conducted in a manner that does not allow additional shaft excavations, excessive vibrations and excessive loads within 15 feet or 3.0 shaft diameters, whichever is greater, within 24 hours of pouring the shaft concrete of the previous drilled shaft.

When installing drilled shafts with embankment placement, construct drilled shafts after the placement of fills.

Do not cap the drilled shafts before placing the fills as near to final grade as possible. Only leave room for construction of the caps.

(B) Construction Methods. Excavate shafts and bell footings to the dimensions and elevations shown in the contract. The 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.

(1) Dry Construction Method. The dry method includes drilling the shaft excavation, removing accumulated water and loose material from the excavation, and placing the 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.

(2) Wet Construction Method. This method includes using water or mineral 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.

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.

(3) Casing Construction Method. The casing method may be used when shown in the contract or at sites where the dry or wet construction methods are inadequate. The casing may be placed either in a predrilled hole or advanced through the ground by twisting, driving, or vibration before cleaning the casing.

(C) Excavation.

(1) General. Make the shaft excavations at the locations, and to the shaft geometry and dimensions shown in the contract. Lower 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. The Engineer will maintain a construction method log during shaft excavation. In general, the log will contain information such as the following:

(a) excavation diameters;

(b) type of material excavated with the elevations in the change of the material;

(c) rate of excavation;

(d) the description of and approximate top and bottom elevation of each soil or rock material;

(e) seepage or groundwater; and

(f) remarks.

Drilling of shafts within a horizontal distance of 3.0 times the shaft diameter (center-to-center) 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. Position the drilled shafts within 3 inches of the required position in a horizontal plane of the top of the shaft elevation.

On projects with cofferdams, provide a qualified diver to inspect the cofferdam conditions when the contract requires a seal for construction. Before placing the concrete seal, the diver shall inspect the cofferdam interior periphery. The cofferdam interior periphery inspection includes each sheeting indentation and around each drilled shaft.

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

When shown in the contract, excavate the bells to form the height and a bearing area of the size and shape specified in the contract. Excavate the bell mechanically.

Furnish drilled shaft concrete required to fill excavations for the bells and shafts dimensioned in the contract at no additional cost to the State.

Do not permit workers to enter the shaft excavation unless:

(a) a suitable casing is installed and the water level is lowered and stabilized, and

(b) adequate safety equipment and procedures are provided.

(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 10 feet or 20% beyond the depths shown in the contract whichever is greater.

The use of special drilling equipment and/or procedures will be necessary to drill through the boulders and basalt rock formation present at the site. The Contractor shall anticipate an abundance of boulders of various sizes in deposits classified as "old alluvium" and "conglomerates" on the logs of borings and shall make allowance for difficult drilling in his/her bid. The Contractor shall also anticipate difficult drilling conditions in deposits classified as basalt formation on the boring logs.

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 procedures will be necessary to drill through the boulders and basalt rock formation and the cost shall be incidental to the respective classes of shaft excavation.

(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 inches 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 additional cost to the State.

(3) Standard Excavation. Standard excavation is excavation done with conventional tools. Conventional tools include augers fitted with soil or rock teeth, drilling buckets, and overreaming attached to drilling equipment. This drilling equipment shall be of the size, power, torque, and down thrust (crowd) accepted for use by the Engineer after successful construction of a trial drilled shaft.

The standard excavation consists of drilling within fill materials and recent alluvium deposits. Fills and recent alluvium deposits are shown on the Logs of Borings.

The Contractor shall 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 pay for obstruction removal separately. The Engineer will be the sole judge in determining the various types of excavations for payment on the contract.

(4) Special Excavation. Special excavation is excavation that requires special tools and/or procedures to advance the drilled hole. The Engineer will pay for special excavation below the depth where conventional tools and drilling equipment accepted for standard excavation, operating at maximum power, torque and down thrust, cannot advance the hole. The Contractor shall get the refusal rate using the standard excavation tools and equipment when hole advancement is less than one (1) foot after (60) minutes of continuous drilling at full power.

Special excavation consists of drilling within the conglomerate and old alluvium deposits. Conglomerate and old alluvium deposits are shown on the Logs of Borings. The Contractor shall anticipate the presence of abundant cobbles, boulders and large rock fragments for the layers designated for special excavation. Cobbles, boulders, and large rock fragments are indicated on the Logs of Borings. Cobbles, boulders and large rock fragments shall not be considered an obstruction regardless of the size and hardness of the materials. Natural features will not be considered an obstruction under this subsection.

Special excavation does not include excavation within the basalt rock formation identified on the logs of borings.

The Engineer will consider special excavation when conglomerate and old alluvium (or other materials with an abundance of cobbles and boulders) are encountered in the drilled hole despite the density or character of materials encountered. The Engineer will be the sole judge in determining the various types of excavations for payment on the contract.

(5) Rock Excavation. Rock excavation is excavation conducted within basalt rock formations by using core barrel and other tools necessary for the removal of the cored material. Basalt rock formations are identified on the Logs of Borings. The Engineer

will consider rock excavation when basalt rock formation is encountered in the drilled hole despite the density or character (hardness) of basalt rock formation encountered. The Engineer will be the sole judge in determining the various types of excavations for payment on the contract.

(6) Obstructions Removal. Remove obstructions at the drilled shaft locations when authorized by the Engineer. Obstructions shall be man-made materials not shown on the Plans, such as old concrete foundations. Obstructions also may consist of boulders embedded in the fills and recent alluvium, when confirmed by the Engineer. Boulders encountered in the other material layers indicated on the logs of borings (conglomerate, old alluvium, and/or basalt rock formation) will not be considered obstructions in this section. Man-made materials and boulders, which may be removed using standard excavation equipment, will also not be considered obstructions.

Drilling tools, lost in excavation, are not considered as obstructions. Remove the drilling tools 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) due to removal operations or the time the hole remains open.

(D) Casings.

(1) General. Casings shall be steel (or corrugated aluminum pipe, where shown in the contract documents), 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. The length of permanent casings installed below the bottom of the footing elevation, shall remain in place.

When the shaft extends above ground or through a body of water, the shaft may be formed with removable casing except when the casing is permanent. For permanent casings, remove the portion of metal casings (or corrugated aluminum pipe) between an elevation of 2 feet below the lowest water elevation and the top of shaft elevation after curing the concrete. Remove the casing carefully so that the casing will not damage the concrete. When the

casing needs to be removed after the concrete hardens in open water, design and submit the special casing system for acceptance by the Engineer. The Contractor may remove the casings when the concrete attains sufficient strength provided that the following conditions are met:

(a) the curing of the concrete continues for the full 72 hour period;

(b) the shaft concrete is not exposed to salt water or moving water for 7 days; and

(c) the concrete reaches a compressive strength of at least 2,500 psi.

(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 the 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) a minimum of 5 feet above the hydrostatic water level, or

(b) the level of drilling fluid.

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. Such improvement may consist of

removing the shaft concrete and extending the shaft deeper providing the shaft is straddled or replaced. Do corrective measures including redesign of footings caused by defective shafts according to the contract at no additional cost to the State or extension of the contract time. The Engineer will not pay for the casing remaining in place.

(3) Permanent Casing. Use permanent casing when specified in the contract. The casing shall be continuous between top and bottom elevations according to the contract. After completing the installation, cut off the permanent casing at the prescribed elevation. Complete the shaft by installing necessary reinforcing steel and concrete in the casing.

When special temporary casings are in the contract or specified in writing by the Engineer, maintain the alignment of the temporary outer casing with the permanent inner casing and a positive, watertight seal between the two casings during excavation and concreting operations.

(E) Slurry. Use only polymer or mineral slurries in the drilling process. 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. Polymer slurries shall have 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 and adequate time (as prescribed by the manufacturer) allotted for dehydration before introducing the slurry into the shaft excavation. The slurry tanks shall have the 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 drilled hole. 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 the following: agitation, circulation and/or adjusting the properties of the slurry. Dispose of slurry in suitable areas off from the project site.

Carry out the control tests using suitable apparatus on the mineral slurry to resolve the density, viscosity and pH. An acceptable range of values for those physical properties is in Table 511-1. Test the density, viscosity, and pH value during the shaft 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 4 hours of slurry use.

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).

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 four 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.

TABLE 511-1
POLYMER, SODIUM BENTONITE OR ATTAPULGITE
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 – 11	8 - 11	pH paper pH meter

* At 20°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 borehole as resolved by the American Petroleum Institute sand content test.

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

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

(F) 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 inches 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.

(G) 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. The reinforcing steel cage includes longitudinal bars, ties, cage stiffener bars, spacers, centralizers, and other necessary appurtenances to complete the cage.

Tie and support the reinforcing steel in the shaft so that the reinforcing steel will remain within allowable tolerances given in Subsection 511.04(I) - Construction Tolerances. Use the concrete spacers at sufficient intervals (near the bottom and at intervals not exceeding 10 feet up the shaft) to insure concentric spacing for the entire cage length. Construct the spacers of accepted material equal in quality and durability to the concrete specified for the shaft. The spacers shall be of adequate dimension to insure a minimum of four inches annular space between the outer portion of the reinforcing 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 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 rebar 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 tie bars for the extra depth, spaced 2-foot on center. Extend the stiffener bars to the final depth. These bars may be lap splice 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.

(H) 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 as shown on the plans. The access tubes shall be round, regular internal diameter, and free of defects so as to permit the free and unobstructed passage of the probes. The access tubes shall be installed

such that all internal joints are flush. The access tube shall be watertight with clean internal and external faces (free of corrosion), the latter to ensure good bond between the concrete and the tubes. The Contractor shall submit a proposal for installation of the access tubes to the Engineer prior to construction. Fit the access tubes with a water-tight germinant cap on the bottom.

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 about 6 inches from the bottom of the reinforcement cage to at least 3.5 feet above the top of the shaft. The top of the access tubes shall be capped all the time to prevent objects from falling in. 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. Do not bend or damage tubes during reinforcement installation operations. If a tremie pipe is used, the tremie pipe shall not be allowed to rest on top of the access tubes during the concrete pour. Fill the tubes with potable water as soon as possible after concrete placement (within 2 hours after concrete placement) and 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 the Engineer using crosshole sonic logging (CSL) after at least one day of curing time, but no later than 14 days after concreting. . The Contractor shall assist in the testing by making all the shafts in the project accessible to the Engineer for testing 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 pouring in each drilled shaft and the surveyed location of each tube. The State will require a minimum of 7-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 511-2. Deviations from the following values shall be used for determining the Concrete Condition Rating.

Table 511-2 Concrete Condition Rating Criteria			
Concrete Condition Rating	Rating Symbol	Velocity Reduction	Indicative Results
Good	G	0 – 10%	Acceptable concrete
Questionable	Q	10% - 25%	Minor concrete contamination or intrusion. Questionable quality concrete.
Poor	P/D	> 25%	Defects exist, possible water slurry contamination, soil intrusion, and or poor quality concrete.
Water	W	V=4760 – 5005 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.

Suspected defective drilled shafts, determined by the Engineer based on the CSL tests, shall be cored by a minimum of 2 cores per shaft by the Contractor. The number of cores and core location within the drilled shaft shall be approved by the Engineer. Cost of coring performed on acceptable drilled shaft will be borne by the State. Cost of coring performed on defective drilled shaft and shaft remediation shall be borne by the Contractor. If the drilled shaft in question is on the critical path, a time extension will be given if the drilled shaft is found to be not defective. Contractor shall submit a corrective methods plan within 14 days of the defective shafts to the Engineer for review and approval prior to their use.

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

(l) Concrete Placement.

(1) General. Place the concrete through a tremie pipe, concrete pump or by drop chute using accepted methods as described below.

If possible, place the concrete immediately after placing the reinforcing steel.

Concrete placement shall be continuous from the bottom to the top elevation of the shaft. Concrete placement shall continue after the shaft is full until good quality concrete is evident at the top of shaft.

The elapsed time from the beginning of concrete placement in the shaft to the completion of the placement shall not exceed two hours. A longer placement time may be requested, and requests shall be submitted to the Engineer for review and approval 30 calendar days prior to the concrete pour (with a longer placement time) is needed.

Before placing the concrete, the Contractor shall submit 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. Also the Contractor shall submit minimum six (6) standard concrete cylinders of the same concrete trial mix as the drilled shaft 24-hour after concrete pour to the Engineer for Ultrasonic Pulse Velocity measurements. The Engineer will perform the Ultrasonic Pulse Velocity test in accordance with ASTM Standard Test Method for Pulse Velocity through Concrete Designation C 597. 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 top surface of the drilled shafts shall be cleaned and roughen 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 placed, 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.

(2) Concreting by Tremie. Tremie methods may be used for concrete placement in wet or dry excavations. Tremie methods shall include a tube of sufficient length, weight, and diameter to discharge concrete at the shaft base elevation. The tremie shall not contain any aluminum parts that will have contact with the concrete. The tremie inside diameter shall be at least 6 times the maximum size of aggregate used in the concrete mix but shall not be less than 6 inches. The inside and outside surfaces of the tremie shall be clean and smooth to permit flow of concrete and unimpeded withdrawal during concreting. The wall thickness of the tremie shall be adequate to prevent crimping or sharp bends that restrict concrete placement.

The tremie used for wet excavation concrete placement shall be watertight. Underwater placement shall not begin until after placing the tremie to the shaft base elevation. Valves, bottom plates or plugs may be used only if concrete discharge begins within one tremie diameter of the base. Remove the plugs from the excavation. When not removing the plugs, an acceptable material will remain that will not cause a defect in the shaft.

Construct the discharge end of the tremie to permit the free radial flow of concrete during placement operations. Immerse the tremie discharge end at least 5 feet in concrete after starting the flow of concrete. The flow of concrete shall be continuous. Maintain the concrete in the tremie at a positive pressure differential to prevent water or slurry intrusion into the shaft concrete.

When removing the tremie line 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 additional cost to the State.

(3) Concreting by Pump. Concrete pumps and 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 are in contact with concrete shall not contain aluminum parts. Pump lines shall have a minimum diameter of 6 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. When the plug is not removed, leave a material accepted by the Engineer that will not cause a defect.

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 additional cost to the State.

(4) Concreting by Drop Chutes. The Engineer will permit free fall placement of concrete only in dry excavations. Dry excavations are excavations where the maximum depth of water does not exceed 3 inches. The Engineer will not permit the free fall method in wet excavations.

Use the drop chutes to direct placement of free fall concrete. Drop chutes shall include a smooth tube of one piece construction or sections that the Contractor may add or remove. The concrete may be placed through a hopper at the top of the tube or side

openings during concrete placement. Support the drop chute so that the free fall of the concrete measured from the bottom of the chute is less than 25 feet.

Concrete placed by free fall shall fall directly to the base without contacting the rebar cage or drilled hole sidewall. When concrete placement causes the shaft excavation to cave or slough, or when the concrete strikes the rebar cage or sidewall, reduce the height of free fall or reduce the rate of concrete flow into the excavation. When the concrete cannot be placed satisfactorily by free fall, use tremie or concrete pump to pour.

(J) 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 inches above and no more than 3 inches below the plan position.

(4) Permanent casing diameters shown in the contract refer to the inside diameter (ID) dimensions. When accepted by the Engineer, a casing larger in diameter than shown in the contract may be provided to ease meeting this requirement. When not using casing, the minimum diameter of the drilled shaft shall be not more than 1 inch less than the specified shaft diameter. When using a series of telescoping casings, size the casing such that the minimum shaft diameters listed above can be maintained.

(5) Excavate the bearing area of bells to the plan bearing area as a minimum. The diameter of the bells shall not exceed three times the specified shaft diameter. Other plan dimensions shown for the bells may vary when accepted by the Engineer.

(6) The top elevation of the shaft shall have a tolerance of ± 1.0 inch from the plan top of shaft elevation.

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

(8) 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.

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 a 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 or size of the reinforcing steel.

(3) Enlarge the bearing area of the bell excavation within the tolerances allowed.

The acceptance of correction procedures is dependent on analysis of the effect of the degree of misalignment and improper positioning. The Engineer may accept the correction methods proposed based on design analysis submitted by the Contractor. A Hawaii Licensed Professional Engineer in the Structural Branch and Civil Branch (specializing in the Geotechnical field) shall stamp and sign the redesign drawings and computations. Correct out of tolerance drilled shaft excavations, including engineering analysis and redesign, at no additional cost to the State.

(K) Integrity Testing. Drilled shafts shall be tested for soundness and integrity, as directed by the Engineer. Integrity testing shall consist of concrete coring at production 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 Contractor shall core a minimum 3-inch diameter vertical hole throughout the full depth of the drilled shaft, and the location of the core hole shall be approved by the Engineer. The Engineer will determine the production drilled shaft to be cored based on the Engineer's records and/or CSL test results. The cored holes shall be filled with non-shrink, non-metallic, non-gaseous cementitious grout of the same minimum strength as the drilled shaft.

511.06 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 maintain the start and stop times, measured to the nearest 0.25 hours, to remove obstructions when considered an obstruction and authorized by the Engineer.

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) Trial Shaft. The Engineer will measure trial 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 existing ground surface before drilling and authorized bottom elevation of the hole.

(E) Permanent Casing. The Engineer will measure permanent casing per linear foot.

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

(F) Standard Shaft Excavation. The Engineer will measure standard shaft excavation per linear foot.

The Engineer will measure the length along the centerline of the shaft. The length shall be the elevation difference between the plan top of shaft and the bottom of standard shaft excavation to the nearest foot discounting the depths from which any material that is removed as an obstruction. The Engineer will maintain a drilled shaft log for payment.

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

(G) Special Shaft Excavation. The Engineer will measure special shaft excavation per linear foot.

The Engineer will measure the length along the centerline of the shaft. The length shall be the elevation difference between the bottom of

standard shaft excavation and the bottom of special shaft excavation to the nearest foot. 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.

(H) Rock Excavation. The Engineer will measure rock excavation per linear foot.

The Engineer will measure the length along the centerline of the shaft. The length shall be the elevation difference between the bottom of standard shaft excavation or special shaft excavation and the plan final bottom of shaft to the nearest foot. 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.

(I) 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.

(J) 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.

511.07 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 Trial 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 standard 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 Tests. The Engineer will pay for the accepted drilled shaft load tests at the contract unit price per each complete in place.

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

(D) Trial Shaft. The Engineer will pay for the accepted trial shaft holes at the contract unit price per linear foot complete in place. The price includes full compensation for excavating including the use of temporary casing, providing inspection facilities, backfilling the hole with concrete, restoring the site, and furnishing labor, materials, equipment, tools and incidentals necessary to complete the work.

The Engineer will not pay for trial shaft holes of which the Contractor has failed to demonstrate to the Engineer the adequacy of Contractor's proposed methods and equipment.

(E) Permanent Casing. The Engineer will pay for the accepted permanent casing at the contract unit price per linear foot complete in place.

The price includes full compensation for furnishing and installing the permanent casing to the specified depths, as dictated by the subsurface conditions, and furnishing labor, materials, equipment, tools and incidentals necessary to complete the work.

The price for the Corrugated Aluminum Pipe (CAP) permanent casing includes full compensation for furnishing and installing the permanent casing to the specified tip elevations, as shown on the Plans, including excavation below the ground surface, placement of the casing, and backfilling the excavation back to the surrounding ground surface with compacted fill, and furnishing labor, materials, equipment, tools and incidentals necessary to complete the work.

(F) Standard Shaft Excavation. The Engineer will pay for the accepted standard 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 for any length of drilled shafts required due to unauthorized over-excavation.

(G) Special Shaft Excavation. The Engineer will pay for the accepted special 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 for any length of drilled shafts required due to unauthorized over-excavation.

(H) Rock Excavation. The Engineer will pay for the accepted rock 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 for any length of drilled shafts required due to unauthorized over-excavation.

(I) 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 and backfilling and concrete cylinders for the Ultrasonic Pulse Velocity testing of concrete) necessary to complete the work.

(J) Coring for Integrity Testing. 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 shafts.

The price includes full compensation for testing the drilled shafts for soundness and integrity by coring, filling the cored holes with non-shrink, non-metallic, non-gaseous cementitious 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
Trial Shaft	Linear Foot
Permanent Casing (___-inch diameter)	Linear Foot
Standard Shaft Excavations (___-inch diameter)	Linear Foot
Special Shaft Excavations (___-inch diameter)	Linear Foot
Rock Excavation (___-inch diameter)	Linear Foot
Drilled Shafts (Type ___)	Linear Foot
Coring for Integrity Testing	Linear Foot

END OF SECTION"

The Engineer will not make allowance for clips, wire or other material used for fastening reinforcement in place.

The Engineer will not measure mesh reinforcement.

602.08 Basis of Payment. The Engineer will pay for reinforcing steel on a contract lump sum basis. The Engineer will not pay for reinforcing steel, structural struts, plates, and straps in water system concrete reaction and test blocks, concrete jacket and reaction beam separately. The Engineer will consider the price for the reinforcing steel, structural struts, plates, and straps in water system concrete reaction and test blocks, concrete jacket and reaction beam as included in the contract price of Section 503 - Concrete Structures.

The price includes full compensation for furnishing and placing threaded reinforcing steel and their inserts; furnishing and testing sample splices and completed splices cut from rebars placed in the work, including replacing or resplicing rebars to the length shown in the contract; furnishing access facilities to permit the Engineer to do the tests, and for losses or delays to the Contractor resulting from the sampling and testing specified herein; and furnishing labor, equipment, materials, tools and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Reinforcing Steel for _____	Lump Sum

The Engineer will not pay for mesh reinforcement separately. The Engineer will consider the cost for mesh reinforcement as included in the contract price of the various contract items."

END OF SECTION

SECTION 624 - WATER SYSTEM

Make the following amendment to said Section:

(I) Amend **624.04(B)(12) Concrete Reaction and Test Blocks, Concrete Jacket and Reaction Beam** to read as follows:

"**(12) Concrete Reaction and Test Blocks, Concrete Jacket and Reaction Beam.** The Engineer will measure concrete in reaction blocks, test blocks, jackets and reaction beams according to Section 503 – Concrete Structures."

(II) Amend **624.05(B)(6) Service Laterals And Service Connections** by revising the second paragraph to read as follows:

"The price includes full compensation for furnishing and installing the service laterals, service connections, pipe sleeves installed through retaining walls to ease later installations of service connections, corporation stops; and furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work."

(III) Amend **624.05(B)(12) Concrete Reaction and Test Blocks, Concrete Jacket and Reaction Beam** by revising the first paragraph to read as follows:

"**(12) Concrete Reaction and Test Blocks, Concrete Jacket and Reaction Beam.** The Engineer will pay for the accepted quantities of concrete in reaction blocks, test blocks, jackets and reaction beams according to Section 503 – Concrete Structures."

(IV) Amend **624.04 Method of Measurement** to add the following:

"**(17) Disinfection**. The Engineer will not measure disinfection of water mains, service laterals and appurtenances for payment."

(V) Amend **624.05 Basis of Payment** to add the following:

"**(25) Disinfection**. The Engineer will not pay for the disinfection of water mains, service laterals and appurtenances for payment. The Engineer will consider disinfection incidental to the various contract items.

The price shall be full compensation for disinfection; providing water for flushing, including providing and installing all water supply equipment and materials, all temporary pipes and fittings, and all pumping or other facilities which are necessary for transporting water from the nearest available source to the project site; flushing; dechlorination; disposal of water used during disinfection in accordance with NPDES and other applicable requirements;

certification for disinfection; and furnishing labor, materials, equipment, tools and incidentals necessary to complete the work. No additional payment will be made due to repeat operations.

Should an NPDES Hydrotesting Waters Permit be required in association with the Contractor's disposal of any water used during hydrotesting, the Engineer will pay for the permit according to Section 209 - Water Pollution and Erosion Control."

END OF SECTION

Make the following Section a part of the Standard Specifications:

"SECTION 658 - GRAVEL BLANKET

658.01 Description. This section is for furnishing gravel blanket within the State-acquired parcels according to the contract.

658.02 Materials. Materials shall conform to the following:

(A) Gravel. Gravel shall be AASHTO M43, No. 67 gradation, and shall conform to the requirements of Subsection 703.02.

(B) Permeable Separator. Permeable separator in load-bearing areas shall be woven geotextile, and shall conform to the requirements of Subsections 716.01 and 716.02.

(C) Weed Barrier. Weed barrier in non load-bearing areas shall be woven, needle-punched polypropylene, 5-ounce weight.

(D) Herbicide. Herbicide shall be a nonemergent and nonselective type, EPA-approved for highway application, and suitable for use under the designed thickness of gravel blanket. The materials shall be free of solvents or other substances deleterious to the geotextile. Application rates shall be at the highest recommended dosage stated on the label. Submit a sample label containing the pertinent data for acceptance by the Engineer before use.

658.03 Construction Requirements.

(A) Applying Herbicide in Load-Bearing Area. Prior to placement of permeable separator in load-bearing area, apply herbicide to prepared subgrade in accordance with the requirements of Section 659 - Herbicide.

(B) Placing Permeable Separator in Load-Bearing Area. After applying herbicide in load-bearing area, and prior to placement of gravel blanket, place permeable separator in accordance with the requirements of Section 648 - Permeable Separator, except that the terms "subbase" and "subbase aggregate" shall be replaced by the term "gravel blanket" for the purposes of this section.

(C) Placing Weed Barrier in Non Load-Bearing Area. Prior to placement of gravel blanket in non load-bearing area and 2" gravel mulch in landscape area, place weed barrier on prepared surface. Overlap edges of weed barrier with adjacent weed barrier fabric a minimum of 6 inches, and tie down with 6-inch long staples 10 feet apart. At the outer

edge, fold weed barrier up and over the plastic edging or up to the top of the concrete sidewalk or curb.

(D) Placing. Place the gravel blanket on the prepared surface, including permeable separator in load-bearing area or weed barrier in landscape area, according to the plans, without segregation. Remix the segregated materials until a uniform distribution is obtained. Do not dump the material in piles on the prepared surface.

Depositing and spreading shall commence at that part of the work farthest from the point of loading the material and shall progress continuously without breaks.

(E) Shaping. Do such shaping work as necessary. The finished gravel blanket shall conform to the required grade and cross-section. The finished gravel blanket where not controlled by adjacent structures or features shall not vary more than 0.04 foot above or below the theoretical grade.

658.04 Method of Measurement. The Engineer will measure gravel blanket per cubic yard.

The Engineer will measure gravel blanket according to the dimensions shown on the plans or as specified by the Engineer.

658.05 Basis of Payment. The Engineer will pay for the accepted gravel blanket at the contract unit price per cubic yard.

The price includes full compensation for preparing the subgrade for the gravel blanket and gravel mulch; furnishing and applying herbicide in load-bearing areas; furnishing and installing permeable separator in load-bearing areas; furnishing and installing weed barrier in non load-bearing areas; furnishing, depositing, spreading, and shaping the gravel blanket; and furnishing labor, material, tools, equipment, and incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
_____ - inch Gravel Blanket in Load-Bearing Area	Cubic Yard
_____ - inch Gravel Blanket in Non Load-Bearing Area	Cubic Yard
_____ - inch Gravel Mulch in Landscape Area	Cubic Yard"

END OF SECTION

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
206.7259	Structure Backfill for Soil Nail Retaining Wall - 4	110	Cu. Yd.	$_____	$_____
206.7260	Structure Backfill for Concrete Barrier Wall - 1	420	Cu. Yd.	$_____	$_____
206.7261	Structure Backfill for Concrete Barrier Wall - 2	300	Cu. Yd.	$_____	$_____
206.7262	Structure Backfill for Concrete Barrier Wall - 3	58	Cu. Yd.	$_____	$_____
206.7263	Structure Backfill for Concrete Barrier Wall - 4	215	Cu. Yd.	$_____	$_____
206.7264	Structure Backfill for Concrete Barrier Wall - 5	514	Cu. Yd.	$_____	$_____
206.8200	Filter Material for Abutments and Wingwalls	11	Cu. Yd.	$_____	$_____
206.8202	Filter Material for Concrete Barrier Walls	90	Cu. Yd.	$_____	$_____
206.9010	Foundation Grouting	F.A.	F.A.	F.A.	$40,000.00
207.0100	Ditch and Channel Excavation	1,600	Cu. Yd.	$_____	$_____
208.0100	Leveling Surfaces	F.A.	F.A.	F.A.	$100,000.00
209.0100	Water Pollution and Erosion Control	F.A.	F.A.	F.A.	$750,000.00
211.1000	Reinforced Soil Slope	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
305.0100	15" Aggregate Subbase	1,519	Cu. Yd.	$_____	$_____
305.0200	12" Aggregate Subbase	434	Cu. Yd.	$_____	$_____
305.0300	6" Aggregate Subbase	2,695	Cu. Yd.	$_____	$_____
306.0100	Untreated Permeable Base Course	3,303	Cu. Yd.	$_____	$_____
312.0100	Plant Mix Glassphalt Concrete Base Course	6,420	Ton	$_____	$_____
401.0100	Asphalt Concrete Pavement, Mix No. IV	2,580	Ton	$_____	$_____
401.0200	Asphalt Concrete Pavement, Mix No. V	134	Ton	$_____	$_____
411.1010	13 1/2-Inch, Concrete Pavement	3,904	Cu. Yd.	$_____	$_____
411.1020	12 1/2-Inch, Concrete Pavement	1,996	Cu. Yd.	$_____	$_____
411.2000	Transverse Contraction Joint	15,000	Lin. Ft.	$_____	$_____
501.0210	Structural Steel for Luminaire Support Bracket at Pono Street, Pomohana Place, and Detour Road	10	Each	$_____	$_____
501.0211	Structural Steel for Overhead Sign Support	L.S.	L.S.	L.S.	$_____
501.2010	8-Inch Pipe Support Hangers	30	Each	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
501.2011	12-Inch Pipe Support Hangers	9	Each	$_____	$_____
503.1080	Concrete for Abutments Retrofit (Austin-Bishop)	L.S.	L.S.	L.S.	$_____
503.1090	Concrete for Abutments, Wingwalls, and Retaining Wall "B" including Type 1 Corbel	L.S.	L.S.	L.S.	$_____
503.1091	Concrete for Abutments, Wingwalls, and Retaining Wall "B" Footings	L.S.	L.S.	L.S.	$_____
503.1092	Concrete for Viaduct Deck Including Drop Inlets on Bridge But Excluding Closure Pour	L.S.	L.S.	L.S.	$_____
503.1093	Concrete for Bent Caps	L.S.	L.S.	L.S.	$_____
503.1094	Concrete for Columns	L.S.	L.S.	L.S.	$_____
503.1095	Concrete for Bent Footings	L.S.	L.S.	L.S.	$_____
503.1096	Concrete for Closure Pour	L.S.	L.S.	L.S.	$_____
503.1097	Concrete for Seat Extender at Abutments	L.S.	L.S.	L.S.	$_____
503.1098	Concrete for Collar at Pier Columns (Austin-Bishop)	L.S.	L.S.	L.S.	$_____
503.1401	Concrete for AW-1	L.S.	L.S.	L.S.	$_____
503.1402	Concrete for Barrier-Wall at Austin-Bishop Separation	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
503.1403	Concrete for Soil Nail Retaining Wall - 1	L.S.	L.S.	L.S.	$_____
503.1404	Concrete for Soil Nail Retaining Wall - 2	L.S.	L.S.	L.S.	$_____
503.1405	Concrete for Soil Nail Retaining Wall - 3	L.S.	L.S.	L.S.	$_____
503.1406	Concrete for Soil Nail Retaining Wall - 4	L.S.	L.S.	L.S.	$_____
503.1407	Concrete for Concrete Barrier Walls - 1 and 2	L.S.	L.S.	L.S.	$_____
503.1408	Concrete for Concrete Barrier Walls - 3, 4, and 5	L.S.	L.S.	L.S.	$_____
503.1409	Concrete for Noise Barrier Wall - 1 Footing	L.S.	L.S.	L.S.	$_____
503.1410	Concrete for Noise Barrier Wall - 2 Footing	L.S.	L.S.	L.S.	$_____
503.1411	Concrete for Noise Barrier Wall - 3 Footing	L.S.	L.S.	L.S.	$_____
503.1416	Concrete for Concrete Barrier Walls - 1 and 2 Footings	L.S.	L.S.	L.S.	$_____
503.1417	Concrete for Concrete Barrier Walls - 3, 4 and 5 Footings	L.S.	L.S.	L.S.	$_____
503.1910	Concrete for Approach Slabs (1st Phase)	L.S.	L.S.	L.S.	$_____
503.1911	Concrete for Approach Slabs Including Type II Corbel (2nd Phase)	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
503.2051	Concrete for Reinforced Concrete for Jacket for 8" Waterline	L.S.	L.S.	L.S.	$_____
503.2052	Concrete for Reaction and Test Blocks (Class B)	L.S.	L.S.	L.S.	$_____
503.8000	Mechanical Grooving	L.S.	L.S.	L.S.	$_____
504.4100	Type Keehi IVM Prestressed Concrete Girders	L.S.	L.S.	L.S.	$_____
507.7000	Concrete Railings on Bridge	1,300	Lin. Ft.	$_____	$_____
507.7002	Concrete Median Barriers (Austin-Bishop)	80	Lin. Ft.	$_____	$_____
511.0100	Furnishing Drilled Shaft Drilling Equipment	L.S.	L.S.	L.S.	$_____
511.0200	Obstructions	80	Hours	$_____	$_____
511.0300	Load Test	2	Each	$_____	$_____
511.0400	Trial Shaft	150	Lin. Ft.	$_____	$_____
511.0500	Permanent Casing (27-Inch I.D. Corrugated Aluminum Pipe)	200	Lin. Ft.	$_____	$_____
511.0600	Permanent Casing (48-Inch Diameter)	500	Lin. Ft.	$_____	$_____
511.0700	Permanent Casing (60-Inch Diameter)	1,600	Lin. Ft.	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
511.0800	Standard Shaft Excavation (20-Inch Diameter)	450	Lin. Ft.	$_____	$_____
511.0910	Standard Shaft Excavation (48-Inch Diameter)	440	Lin. Ft.	$_____	$_____
511.0920	Special Shaft Excavation (48-Inch Diameter)	170	Lin. Ft.	$_____	$_____
511.0930	Rock Excavation (48-inch Diameter)	460	Lin. Ft.	$_____	$_____
511.1010	Standard Shaft Excavation (60-Inch Diameter)	1,750	Lin. Ft.	$_____	$_____
511.1020	Special Shaft Excavation (60-Inch Diameter)	1,850	Lin. Ft.	$_____	$_____
511.1030	Rock Excavation (60-inch Diameter)	600	Lin. Ft.	$_____	$_____
511.1100	Drilled Shaft (Type 20)	450	Lin. Ft.	$_____	$_____
511.1200	Drilled Shaft (Type 27)	200	Lin. Ft.	$_____	$_____
511.1300	Drilled Shaft (Type 48B)	270	Lin. Ft.	$_____	$_____
511.1400	Drilled Shaft (Type 48C)	980	Lin. Ft.	$_____	$_____
511.1500	Drilled Shaft (Type 60A)	850	Lin. Ft.	$_____	$_____
511.1600	Drilled Shaft (Type 60B)	870	Lin. Ft.	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
511.1700	Drilled Shaft (Type 60C)	2,030	Lin. Ft.	$_____	$_____
511.1800	Coring Samples (Integrity Testing)	750	Lin. Ft.	$_____	$_____
513.0101	CMU Noise Barrier Walls	1,900	Sq. Yd.	$_____	$_____
530.0101	Segmental Retaining Wall No. 1	L.S.	L.S.	L.S.	$_____
530.0102	Segmental Retaining Wall No. 2A	L.S.	L.S.	L.S.	$_____
530.0103	Segmental Retaining Wall No. 2B	L.S.	L.S.	L.S.	$_____
530.0104	Segmental Retaining Wall No. 2C	L.S.	L.S.	L.S.	$_____
540.1000	Replacement Concrete for Frame A - Honolulu Half	L.S.	L.S.	L.S.	$_____
540.1001	Replacement Concrete for Frame A - Waianae Half	L.S.	L.S.	L.S.	$_____
540.1002	Replacement Concrete for Frame B	L.S.	L.S.	L.S.	$_____
540.1003	Replacement Concrete for Frame C	L.S.	L.S.	L.S.	$_____
540.1004	Replacement Concrete for Frame D	L.S.	L.S.	L.S.	$_____
540.1005	Tensile Bond Test	180	Each	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
602.0050	Reinforcing Steel for AW-1	L.S.	L.S.	L.S.	$_____
602.0051	Reinforcing Steel for Barrier-Wall at Austin-Bishop Separation	L.S.	L.S.	L.S.	$_____
602.0052	Reinforcing Steel for Soil Nail Retaining Walls	L.S.	L.S.	L.S.	$_____
602.0053	Reinforcing Steel for Concrete Barrier Walls	L.S.	L.S.	L.S.	$_____
602.0054	Reinforcing Steel for Concrete Barrier Wall Footings	L.S.	L.S.	L.S.	$_____
602.0055	Reinforcing Steel for Noise Barrier Walls	L.S.	L.S.	L.S.	$_____
602.0056	Reinforcing Steel for Noise Barrier Wall Footings	L.S.	L.S.	L.S.	$_____
602.0090	Reinforcing Steel for Abutments, Wingwalls, and Retaining Wall "B" Including Type 1 Corbel	L.S.	L.S.	L.S.	$_____
602.0091	Reinforcing Steel for Abutments, Wingwalls, and Retaining Wall "B" Footings	L.S.	L.S.	L.S.	$_____
602.0092	Reinforcing Steel for Viaduct Deck Including Drop Inlets on Bridge But Excluding Closure Pour	L.S.	L.S.	L.S.	$_____
602.0093	Reinforcing Steel for Bent Caps	L.S.	L.S.	L.S.	$_____
602.0094	Reinforcing Steel for Columns	L.S.	L.S.	L.S.	$_____
602.0095	Reinforcing Steel for Bent Footings	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
602.0096	Reinforcing Steel for Closure Pour	L.S.	L.S.	L.S.	$_____
602.0097	Reinforcing Steel for Seat Extender at Abutments	L.S.	L.S.	L.S.	$_____
602.0098	Reinforcing Steel for Approach Slabs (1st Phase)	L.S.	L.S.	L.S.	$_____
602.0099	Reinforcing Steel for Approach Slabs Including Type II Corbel (2nd Phase)	L.S.	L.S.	L.S.	$_____
602.0100	Reinforcing Steel for Abutments Retrofit (Austin-Bishop)	L.S.	L.S.	L.S.	$_____
602.0101	Reinforcing Steel for Collar at Pier Columns (Austin-Bishop)	L.S.	L.S.	L.S.	$_____
603.0010	Bed Course Material for Culvert	939	Cu. Yd.	$_____	$_____
603.0210	8-Inch Ductile Iron Pipe, Class 52	723	Lin. Ft.	$_____	$_____
603.0220	12-Inch Ductile Iron Pipe, Class 52	65	Lin. Ft.	$_____	$_____
603.0310	6-Inch Polyvinyl Chloride Pipe, SDR 35	64	Lin. Ft.	$_____	$_____
603.0320	8-Inch Polyvinyl Chloride Pipe, SDR 35	192	Lin. Ft.	$_____	$_____
603.0330	12-Inch Polyvinyl Chloride Pipe, SDR 35	15	Lin. Ft.	$_____	$_____
603.1010	24-Inch Reinforced Concrete Pipe, Class III	21	Lin. Ft.	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
603.1020	36-Inch Reinforced Concrete Pipe, Class III	36	Lin. Ft.	$_____	$_____
603.1030	24-Inch Reinforced Concrete Pipe, Class III, or 24-Inch High Density Polyethylene Pipe, Type S	2,658	Lin. Ft.	$_____	$_____
603.1040	30-Inch Reinforced Concrete Pipe, Class III, or 30-Inch High Density Polyethylene Pipe, Type S	189	Lin. Ft.	$_____	$_____
603.1050	36-Inch Reinforced Concrete Pipe, Class III, or 36-Inch High Density Polyethylene Pipe, Type S	663	Lin. Ft.	$_____	$_____
603.2010	Column Drain Cleanout	22	Each	$_____	$_____
603.2020	Drain Cleanout to Grade	7	Each	$_____	$_____
603.4010	Concrete Collar for 24-Inch Drain Connection	1	Each	$_____	$_____
603.4020	Concrete Collar for 36-Inch Drain Connection	1	Each	$_____	$_____
603.5010	Clean Existing Culverts	F.A.	F.A.	F.A.	$750,000.00
604.0210	Inlet Structure, 2 feet to 2.99 feet	1	Each	$_____	$_____
604.0220	Inlet Structure, 11 feet to 11.99 feet	1	Each	$_____	$_____
604.0310	Type A Storm Drain Manhole, 5 feet to 5.99 feet	1	Each	$_____	$_____
604.0320	Type A Storm Drain Manhole, 6 feet to 6.99 feet	2	Each	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
604.0330	Type A Storm Drain Manhole, 8 feet to 8.99 feet	1	Each	$_____	$_____
604.0340	Type A Storm Drain Manhole, 10 feet to 10.99 feet	1	Each	$_____	$_____
604.0402	Standard Valve Box For Gate Valve	3	Each	$_____	$_____
604.0403	Air Relief Valve Box	1	Each	$_____	$_____
604.0410	Type B Storm Drain Manhole, 4 feet to 4.99 feet	1	Each	$_____	$_____
604.0411	Type B Storm Drain Manhole, 5 feet to 5.99 feet	1	Each	$_____	$_____
604.0510	Type E Storm Drain Manhole, 6 feet to 6.99 feet	1	Each	$_____	$_____
604.0610	Special Storm Drain Manhole, 4 feet to 4.99 feet	1	Each	$_____	$_____
604.0620	Special Storm Drain Manhole, 5 feet to 5.99 feet	2	Each	$_____	$_____
604.0630	Special Storm Drain Manhole, 6 feet to 6.99 feet	1	Each	$_____	$_____
604.0640	Special Storm Drain Manhole, 7 feet to 7.99 feet	2	Each	$_____	$_____
604.0650	Special Storm Drain Manhole, 8 feet to 8.99 feet	2	Each	$_____	$_____
604.0660	Special Storm Drain Manhole, 15 feet to 15.99 feet	1	Each	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
604.0670	Adjust Storm Drain Manhole Frame and Cover	1	Each	$_____	$_____
604.4302	Adjusting Sewer Manhole Frame and Cover	5	Each	$_____	$_____
604.4550	Adjusting Valve Box Frame and Cover	4	Each	$_____	$_____
604.5020	Type A1 Grated Drop Inlet, 5 feet to 5.99 feet	5	Each	$_____	$_____
604.5030	Type A1 Grated Drop Inlet, 6 feet to 6.99 feet	3	Each	$_____	$_____
604.5040	Type A1 Grated Drop Inlet, 7 feet to 7.99 feet	2	Each	$_____	$_____
604.5050	Type A1 Grated Drop Inlet, 8 feet to 8.99 feet	1	Each	$_____	$_____
604.5060	Type A1 Grated Drop Inlet, 10 feet to 10.99 feet	1	Each	$_____	$_____
604.5070	Type A1 Grated Drop Inlet, 14 feet to 14.99 feet	1	Each	$_____	$_____
604.5120	Type A2 Grated Drop Inlet, 5 feet to 5.99 feet	6	Each	$_____	$_____
604.5130	Type A2 Grated Drop Inlet, 6 feet to 6.99 feet	4	Each	$_____	$_____
604.5140	Type A2 Grated Drop Inlet, 7 feet to 7.99 feet	1	Each	$_____	$_____
604.5150	Type A2 Grated Drop Inlet, 13 feet to 13.99 feet	1	Each	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
604.5230	Type A3 Grated Drop Inlet, 7 feet to 7.99 feet	3	Each	$_____	$_____
604.5240	Type A3 Grated Drop Inlet, 9 feet to 9.99 feet	1	Each	$_____	$_____
604.5250	Type A3 Grated Drop Inlet, 12 feet to 12.99 feet	1	Each	$_____	$_____
604.5310	Type A4 Grated Drop Inlet, 10 feet to 10.99 feet	1	Each	$_____	$_____
604.5410	Type A5 Grated Drop Inlet, 9 feet to 9.99 feet	1	Each	$_____	$_____
604.6010	Type D Catch Basin, 4 feet to 4.99 feet	1	Each	$_____	$_____
604.6020	Type D Catch Basin, 5 feet to 5.99 feet	2	Each	$_____	$_____
604.7010	Type B4 Steel Frame and Grate	11	Each	$_____	$_____
604.7020	Type B6 Steel Frame and Grate	1	Each	$_____	$_____
604.7030	Type B8 Steel Frame and Grate	1	Each	$_____	$_____
604.8010	Column Outlet Structure, Type A	9	Each	$_____	$_____
604.8020	Column Outlet Structure, Type B	1	Each	$_____	$_____
604.8030	Column Outlet Structure, Type C	2	Each	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
604.8040	Trench Drain	418	Lin. Ft.	$_____	$_____
605.0110	6-Inch Underdrain Pipe	6,910	Lin. Ft.	$_____	$_____
605.0301	Underdrain Outlet Type 1	2	Each	$_____	$_____
605.0302	Underdrain Outlet Type 2	1	Each	$_____	$_____
605.2010	Underdrain Cleanout Type A	6	Each	$_____	$_____
605.2020	Underdrain Cleanout Type B	3	Each	$_____	$_____
605.2030	Underdrain Cleanout Type C	6	Each	$_____	$_____
605.2040	Underdrain Cleanout Type D	6	Each	$_____	$_____
605.2050	Underdrain Cleanout Type E	9	Each	$_____	$_____
605.2060	Underdrain Cleanout Type F	2	Each	$_____	$_____
606.1010	Strong Post W-Beam Guardrail	58	Lin. Ft.	$_____	$_____
606.2010	End Anchorage Type ET-2000	1	Each	$_____	$_____
606.3010	State Furnished Portable Concrete Barrier	25	Each	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
607.1010	Six-Feet, Chain Link Fence with Top Rail	4,639	Lin. Ft.	$_____	$_____
607.1020	Six-Feet, Chain Link Fence without Top Rail	94	Lin. Ft.	$_____	$_____
607.1030	Eight-Feet, Chain Link Fence without Top Rail	2,168	Lin. Ft.	$_____	$_____
607.1040	Eight-Feet, Chain Link Fence with Barbed Wire	1,559	Lin. Ft.	$_____	$_____
607.3001	Chain Link Gate, Six Feet High and Four Feet Wide	2	Each	$_____	$_____
607.3002	Chain Link Gate, Six Feet High and Ten Feet Wide	1	Each	$_____	$_____
607.3010	Chain Link Gate, Eight Feet High and Fifteen Feet Wide	3	Each	$_____	$_____
607.3020	Chain Link Gate, Eight Feet High and Sixteen Feet Wide	2	Each	$_____	$_____
607.3030	Chain Link Gate, Eight Feet High and Twenty Feet Wide	1	Each	$_____	$_____
607.3040	Chain Link Gate, Eight Feet High and Twenty-four Feet Wide	3	Each	$_____	$_____
608.0100	Concrete Sidewalk	772	Sq. Yd.	$_____	$_____
609.0110	Curb and Gutter, Type 2DG	794	Lin. Ft.	$_____	$_____
609.0120	Rolled Curb	285	Lin. Ft.	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
609.0130	Thru Gutter	45	Lin. Ft.	$_____	$_____
609.0210	Concrete Header	480	Lin. Ft.	$_____	$_____
610.0110	15-Foot Wide Reinforced Concrete Driveway	1	Each	$_____	$_____
610.0111	20-Foot Wide Reinforced Concrete Driveway	1	Each	$_____	$_____
610.0112	40.3-Foot Wide Reinforced Concrete Driveway	1	Each	$_____	$_____
612.0110	Grouted Rubble Paving for GRP Blanket, Including 6-Inch Bed Course	280	Cu. Yd.	$_____	$_____
612.0120	Grouted Rubble Paving for 6' x 6' GRP Pad	7	Cu. Yd.	$_____	$_____
614.0100	Standard Street Survey Monuments	2	Each	$_____	$_____
616.0610	Sprinkler System	L.S.	L.S.	L.S.	$_____
616.0620	High Voltage Work	L.S.	L.S.	L.S.	$_____
616.0630	Low Voltage Work	L.S.	L.S.	L.S.	$_____
617.0900	Planting Soil	L.S.	L.S.	L.S.	$_____
618.1510	Grassed Surfaces, Zoysia 'El Toro' Grass in the planting area over Erosion Control Matting	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
618.1520	Grassed Surfaces, Zoysia 'El Toro' Grass w/ Hydromulch in the remaining planting area	L.S.	L.S.	L.S.	$_____
619.1710	Plastic Edging	800	Lin. Ft.	$_____	$_____
619.1750	Planting Trees, Loulu Palm (Pritchardia hillebrandii), 7 Gal., 2' High-Brown Trunk	30	Each	$_____	$_____
619.1751	Planting Trees, Foxtail Palm (Wodyetia bifurcata), 25 Gal., 3' High-Brown Trunk	12	Each	$_____	$_____
619.1752	Planting Trees, Alexander Palm (Archontophoenix alexandrae), 25 Gal., 3' High-Brown Trunk	20	Each	$_____	$_____
619.1753	Planting Trees, Chinese Fan Palm (Livistona chinensis), 5 Gal., 18" High-Brown Trunk	20	Each	$_____	$_____
619.1754	Planting Trees, MacArthur Palm (Ptychosperma macarthurii), 25 Gal., 3' High-Brown Trunk	18	Each	$_____	$_____
619.1755	Planting Shrubs, Oleander 'Red'. 'Pink', & 'Salmon' (Nerium oleander), 24" high	670	Each	$_____	$_____
619.1756	Planting Shrubs, Naupaka (Scaevola taccada), 24" high	50	Each	$_____	$_____
619.1757	Planting Shrubs, Plumbago (Plumago auriculata), 24" high	440	Each	$_____	$_____
619.1758	Planting Shrubs, False Eranthemum (Pseudoeranthemum carruthersii), 24" high, with 2-inch layer of gravel mulch and weed barrier w/in planter bed.	1,470	Each	$_____	$_____
621.0200	Panel for Destination Sign	1,062	Sq. Ft.	$_____	$_____
621.3000	Type VI Footing for Destination Sign	12	Each	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
621.4000	Relocation of Existing Destination Sign	4	Each	$_____	$_____
621.4100	Relocation of Existing Regulatory Sign	7	Each	$_____	$_____
621.4200	Relocation of Sign	8	Each	$_____	$_____
621.4600	2.50-Inch Galvanized Square Tube	10	Each	$_____	$_____
621.4700	Breakaway Sign Post and Foundation for Destination Sign	4	Each	$_____	$_____
621.4800	Galvanized Steel Post for Ground-Mounted Destination and Expressway Sign	235	Lin. Ft.	$_____	$_____
621.5100	Regulatory and Warning Sign 10 Sq. Ft. or Less with Post	6	Each	$_____	$_____
621.5200	Type II Object Markers	4	Each	$_____	$_____
621.7020	Construction Sign - "Notice to Motorists"	L.S.	L.S.	L.S.	$_____
622.0051	Highway Lighting Standard with 40 Foot Luminaire Mounting Height, Breakaway Transformer Base, 15 Foot Bracket Arm, Luminaire and Foundation, Mounted in Grade	6	Each	$_____	$_____
622.0052	Highway Lighting Standard with 40 Foot Luminaire Mounting Height, Non-Breakaway Transformer Base, 15 Foot Bracket Arm, Luminaire and Foundation, Mounted on Wall	26	Each	$_____	$_____
622.0053	Highway Lighting Standard with 40 Foot Luminaire Mounting Height, Non-Breakaway Transformer Base, 15 Foot Bracket Arm, Luminaire and Foundation, Mounted on Viaduct	9	Each	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
622.0054	Highway Lighting Standard with 35 Foot Luminaire Mounting Height, Breakaway Transformer Base, 15 Foot Bracket Arm, Luminaire and Foundation, Mounted in Grade	3	Each	$_____	$_____
622.0055	Highway Lighting Standard with 35 Foot Luminaire Mounting Height, Non-Breakaway Transformer Base, 15 Foot Bracket Arm, Luminaire and Foundation, Mounted on Wall	2	Each	$_____	$_____
622.0056	Highway Lighting Standard with 30 Foot Luminaire Mounting Height, Non-Breakaway Transformer Base, 8 Foot Bracket Arm, Luminaire and Foundation, Mounted in Grade	1	Each	$_____	$_____
622.0057	Highway Lighting Standard with 30 Foot Luminaire Mounting Height, Non-Breakaway Transformer Base, 8 Foot Bracket Arm, Luminaire and Foundation, Mounted in Grade in C&C right of Way	3	Each	$_____	$_____
622.0061	Underpass Lighting Luminaire, Wall Mounted	10	Each	$_____	$_____
622.0062	Underpass Lighting Luminaire, Ceiling Mounted	6	Each	$_____	$_____
622.0063	Highway Signage Lighting Luminaire	15	Each	$_____	$_____
622.0064	Relocate Highway Lighting Luminaire with Bracket Arm Mounted on Wood Pole	2	Each	$_____	$_____
622.0601	Remove Highway Lighting Standard in Grade, Abandon Foundation	28	Each	$_____	$_____
622.0602	Remove Highway Lighting Standard on Concrete Barrier, Demolish Foundation	6	Each	$_____	$_____
622.0603	Remove Highway Lighting Standard on Viaduct Railing, Demolish Foundation	6	Each	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
622.0604	Remove Underpass Lighting Luminaire	24	Each	$_____	$_____
622.0605	Remove Highway Signage Lighting Luminaire	2	Each	$_____	$_____
622.0801	Type "A" Highway Lighting Pullbox	3	Each	$_____	$_____
622.0802	Type "B" Highway Lighting Pullbox	6	Each	$_____	$_____
622.0803	Type "B" Communications Pull Box	2	Each	$_____	$_____
622.0804	Type "C" Highway Lighting Pullbox	2	Each	$_____	$_____
622.0805	Adjust Pullbox Frame and Cover	2	Each	$_____	$_____
622.0901	24" x 18" x 10" Cast Highway Lighting Junction Box	1	Each	$_____	$_____
622.0902	30" x 10" x 6" Cast Highway Lighting Junction Box	7	Each	$_____	$_____
622.0903	30" x 10" x 6" Cast Communications Junction Box	20	Each	$_____	$_____
622.0904	12" Square x 8" Deep Stainless Steel Junction Box	3	Each	$_____	$_____
622.0905	6" Square x 4" Deep stainless Steel Junction Box	13	Each	$_____	$_____
622.3002	Two-4-Inch HECO Ductline	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
622.5031	One 4-Inch, One 2-Inch, PVC Schedule 80 Conduit Ductline Encased in Concrete for Highway Communication System	L.S.	L.S.	L.S.	$_____
622.5032	One 2-Inch PVC Schedule 80 Conduit Ductline Encased in Concrete for Highway Lighting System	L.S.	L.S.	L.S.	$_____
622.5033	Two 2-Inch PVC Schedule 80 Conduit Ductline Encased in Concrete for Highway Lighting System	L.S.	L.S.	L.S.	$_____
622.5034	Three 2-Inch PVC Schedule 80 Conduit Ductline Encased in Concrete for Highway Lighting System	L.S.	L.S.	L.S.	$_____
622.5035	One 2-Inch PVC Schedule 40 Conduit Ductline Encased in Concrete for Street Lighting System	L.S.	L.S.	L.S.	$_____
622.5036	One 3-Inch PVC Schedule 80 Conduit Ductline in Concrete Structure for Highway Communication System	L.S.	L.S.	L.S.	$_____
622.5037	One 2-Inch PVC Schedule 80 Conduit Ductline in Concrete Structure for Highway Communication System	L.S.	L.S.	L.S.	$_____
622.5038	Two 2-Inch PVC Schedule 80 Conduit Ductline in Concrete Structure for Highway Lighting System	L.S.	L.S.	L.S.	$_____
622.5043	One 1-Inch PVC Coated Galvanized Rigid Steel Conduit for Highway Lighting System	L.S.	L.S.	L.S.	$_____
622.6001	#2 AWG Conductors for Highway Lighting System	L.S.	L.S.	L.S.	$_____
622.6002	#6 AWG Conductors for Highway Lighting System	L.S.	L.S.	L.S.	$_____
622.6003	#10 AWG Conductors for Highway Lighting System	L.S.	L.S.	L.S.	$_____
622.6004	#6 AWG Grounding Conductor for Highway Lighting System	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
622.6005	#8 AWG Grounding Conductor for Highway Lighting System	L.S.	L.S.	L.S.	$_____
622.6008	#10 AWG Grounding Conductor for Highway Lighting System	L.S.	L.S.	L.S.	$_____
622.8102	Detour Road Temporary Lighting System	L.S.	L.S.	L.S.	$_____
622.9001	Service Equipment Enclosure, Metering Equipment, Apparatus and Control Devices	L.S.	L.S.	L.S.	$_____
622.9002	Concrete Transformer Pad	L.S.	L.S.	L.S.	$_____
623.0010	Loop Detector Sensing Unit (6 Ft. x 6 Ft.), Two Loops	1	Each	$_____	$_____
624.0172	8-Inch Gate Valve (Class 150)	3	Each	$_____	$_____
624.0173	3/4-Inch Air Relief Valve	1	Each	$_____	$_____
624.1806	Ductile Iron Fittings	4,905	Lb.	$_____	$_____
624.9000	8-Inch Ductile Iron Pipe, Class 52	251	Lin. Ft.	$_____	$_____
625.1010	Plain Pre-Cast Sewer Manhole, 7 feet to 7.99 feet	1	Each	$_____	$_____
625.1011	Plain Pre-Cast Sewer Manhole, 8 feet to 9.99 feet	1	Each	$_____	$_____
625.1020	Cast-In-Place Sewer Manhole, 7 feet to 7.99 feet	1	Each	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
625.1021	Cast-In-Place Sewer Manhole, 8 feet to 8.99 feet	3	Each	$_____	$_____
625.2010	10-Inch Vitrified Clay Sewer Pipe	125	Lin. Ft.	$_____	$_____
625.2020	15-Inch Vitrified Clay Sewer Pipe	212	Lin. Ft.	$_____	$_____
625.3000	Reinforced Concrete Jacket for 15-Inch Sewer Pipe	52	Lin. Ft.	$_____	$_____
625.4000	Bed Course Material for Crushed Rock Cradle	30	Cu. Yd.	$_____	$_____
625.5000	Repair Existing Sewer Manhole Lining and Seal	L.S.	L.S.	L.S.	$_____
628.0100	Shotcrete	2,700	Sq. Yd.	$_____	$_____
629.1010	1-Inch Permanent Barrier Guidance Striping (Paint)	L.S.	L.S.	L.S.	$_____
629.1030	4-Inch Pavement Striping (Tape, Type III or Thermoplastic Extrusion)	L.S.	L.S.	L.S.	$_____
629.1050	8-Inch Pavement Striping (Tape, Type III or Thermoplastic Extrusion)	L.S.	L.S.	L.S.	$_____
629.1060	12-Inch Pavement Striping (Tape, Type III or Thermoplastic Extrusion)	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
629.1130	Pavement Words (Tape, Type III or Thermoplastic Extrusion)	1	Each	$_____	$_____
629.1140	Pavement Symbol (Tape, Type III or Thermoplastic Extrusion)	12	Each	$_____	$_____
629.2010	Type A Pavement Marker	L.S.	L.S.	L.S.	$_____
629.2030	Type C Pavement Marker	L.S.	L.S.	L.S.	$_____
629.2040	Type D Pavement Marker	L.S.	L.S.	L.S.	$_____
629.2070	Type H Pavement Marker	L.S.	L.S.	L.S.	$_____
635.0010	Microcomputer System (Not to Exceed $10,000.00)	L.S.	L.S.	L.S.	$_____
636.0010	Field Offices (Not to Exceed $108,000.00 for Two Field Offices)	L.S.	L.S.	L.S.	$_____
636.0020	Project Site Laboratory (Not to Exceed $30,000.00)	L.S.	L.S.	L.S.	$_____
636.0030	Maintenance of Field Offices and Laboratory	F.A.	F.A.	F.A.	$80,000.00
638.0100	Cellular Phones (Not to Exceed $900.00 Each for Seven Phones)	L.S.	L.S.	L.S.	$_____
638.0200	Cellular Phone Additional Charges	F.A.	F.A.	F.A.	$1,000.00

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
640.0110	Lined Drainage Ditch, Type "A"	3,094	Lin. Ft.	$_____	$_____
640.0120	Lined Drainage Ditch, Type "B"	611	Lin. Ft.	$_____	$_____
640.0130	Lined Drainage Ditch, Type "C"	760	Lin. Ft.	$_____	$_____
640.0140	Lined Drainage Ditch, Type "D"	83	Lin. Ft.	$_____	$_____
640.0150	Lined Drainage Ditch, Type "F"	422	Lin. Ft.	$_____	$_____
640.0160	Lined Drainage Ditch, Type "G"	10	Lin. Ft.	$_____	$_____
640.1010	Reconstruct Existing Concrete Ditch	4	Lin. Ft.	$_____	$_____
640.2010	Column Outlet Swale, Type A	66	Lin. Ft.	$_____	$_____
640.2020	Column Outlet Swale, Type B	50	Lin. Ft.	$_____	$_____
645.0100	Additional Police Officers And/Or Additional Traffic Control Devices	F.A.	F.A.	F.A.	$1,500,000.00
647.1001	Three 5-Inch HECO Ductline	220	Lin. Ft.	$_____	$_____
647.1002	Two 5-Inch HECO Ductline	95	Lin. Ft.	$_____	$_____
647.1003	One 5-Inch HECO Ductline	25	Lin. Ft.	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
647.1004	One 3-Inch HECO Ductline	330	Lin. Ft.	$_____	$_____
647.3000	5' x 7' HECO Handhole	2	Each	$_____	$_____
647.4000	HECO Pole Riser	3	Each	$_____	$_____
647.5000	Demolish HECO Handhole	1	Each	$_____	$_____
647.6000	Remove HECO Pole Riser	2	Each	$_____	$_____
649.1001	Two 4-Inch Verizon Ductline	390	Lin. Ft.	$_____	$_____
649.1002	One 4-Inch Verizon Ductline	30	Lin. Ft.	$_____	$_____
649.1003	One 2-Inch Verizon Ductline	70	Lin. Ft.	$_____	$_____
649.2001	One 4-Inch Oceanic Cable Ductline	180	Lin. Ft.	$_____	$_____
649.3001	4' x 6' Verizon Handhole	1	Each	$_____	$_____
649.3002	3' x 5' Verizon Handhole	2	Each	$_____	$_____
649.3003	2' x 6' Oceanic Cable Handhole	1	Each	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
649.4001	Verizon Pole Riser	3	Each	$_____	$_____
649.4002	Oceanic Cable Pole Riser	1	Each	$_____	$_____
649.5000	Demolish Verizon Handhole	3	Each	$_____	$_____
649.6000	Remove Verizon Pole Riser	3	Each	$_____	$_____
649.7000	Relocate Oceanic Cable Metering Equipment	1	Each	$_____	$_____
650.0100	Curb Ramps, Type B	2	Each	$_____	$_____
652.0020	1 1/2 - Inch Cold Planing	96	Sq. Yd.	$_____	$_____
652.0030	2 - Inch Cold Planing	2,622	Sq. Yd.	$_____	$_____
653.0100	162-Inch Structural Plate Culvert Lining	L.S.	L.S.	L.S.	$_____
654.1000	Cable Restrainer Assembly	18	Each	$_____	$_____
655.0001	Drilling Holes and Installing Dowel Reinforcing Bars for AW-1	24	Each	$_____	$_____
655.1000	Drilling Holes and Installing Dowel Reinforcing Bars into Existing Deck	2,500	Each	$_____	$_____
655.1001	Drilling Holes and Installing Dowel Reinforcing Bars into Existing Girder	74	Each	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
655.1002	Drilling Holes and Installing Dowel Reinforcing Bars into Existing Bent Cap	650	Each	$_____	$_____
655.1003	Drilling Holes and Installing Dowel Reinforcing Bars into Existing Abutment Walls	30	Each	$_____	$_____
655.1004	Drilling Holes and Installing Dowel Reinforcing Bars into Existing Abutment Wall Footings	28	Each	$_____	$_____
655.1005	Drilling Holes and Installing Dowel Reinforcing Bars for Seat Extender at Abutment	846	Each	$_____	$_____
655.1006	Drilling Holes and Installing Dowel Reinforcing Bars for Approach Slab	34	Each	$_____	$_____
655.1007	Drilling Holes and Installing Dowel Reinforcing Bars for Abutment Retrofit (Austin-Bishop)	1,652	Each	$_____	$_____
655.1008	Drilling Holes and Installing Dowel Reinforcing Bars for Concrete Collar at Pier Columns (Austin-Bishop)	168	Each	$_____	$_____
655.1009	Drilling Holes and Installing Dowel Reinforcing Bars for Concrete Barriers (Austin-Bishop)	168	Each	$_____	$_____
656.0001	Furnishing Specialty Equipment	L.S.	L.S.	L.S.	$_____
656.0100	Soil Nails (No. 9 Bar)	1,400	Lin. Ft.	$_____	$_____
656.0101	Soil Nails (No. 10 Bar)	4,800	Lin. Ft.	$_____	$_____
656.0102	Soil Nails (No. 11 Bar)	7,600	Lin. Ft.	$_____	$_____
657.0100	Furnishing Jet Grouting Equipment	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
657.0200	Jet Grout Test Program	L.S.	L.S.	L.S.	$_____
657.0300	Test Probes	1,400	Lin. Ft.	$_____	$_____
657.0400	Instrumentation and Monitoring	L.S.	L.S.	L.S.	$_____
657.0500	Jet Grout Columns (Area A)	11,000	Lin. Ft.	$_____	$_____
657.0600	Jet Grout Columns (Area B)	600	Lin. Ft.	$_____	$_____
657.0700	Jet Grout Columns (Area C)	1,100	Lin. Ft.	$_____	$_____
658.0100	10-Inch Gravel Blanket in Load-Bearing Area	239	Cu. Yd.	$_____	$_____
658.0200	6-Inch Gravel Blanket in Non Load-Bearing Area	1,360	Cu. Yd.	$_____	$_____
658.0300	2-Inch Gravel Mulch in Landscape Area	50	Cu. Yd.	$_____	$_____
660.1000	Composite Epoxy Resin-Fiber System for Pier Column Retrofit (Austin-Bishop)	2,130	Sq. Ft.	$_____	$_____
663.1000	Erosion Control Matting	11,000	Sq. Yd.	$_____	$_____
664.0100	Furnish and Install Emergency Telephone	2	Each	$_____	$_____
664.0210	Install Relocated Emergency Telephone Base Assembly	1	Each	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
664.0220	Remove and Reinstall Relocated Emergency Telephone Call Box Unit Assembly	F.A.	F.A.	F.A.	$10,000.00
667.1001	Advanced CCTV Control & Display System	L.S.	L.S.	L.S.	$_____
667.2001	Communication Equipment - Fiberoptic Video Transmitter	2	Each	$_____	$_____
667.2002	Communication Equipment - Fiberoptic Video Receiver	2	Each	$_____	$_____
667.2003	Communication Equipment - Rack Mount Card Cage	2	Each	$_____	$_____
667.2004	Communication Equipment - Gigabit Ethernet Switch	2	Each	$_____	$_____
667.2005	Communication Equipment - Multiport Serial Card	1	Each	$_____	$_____
667.2006	Communication Equipment - Control Cable (400 Lin. Ft.)	1	Each	$_____	$_____
667.2007	Communication Equipment - RG59 Cable (400 Lin. Ft.)	1	Each	$_____	$_____
667.2008	Communication Equipment - Cat. 6 Cable (100 Lin. Ft.)	1	Each	$_____	$_____
667.2009	Communication Equipment - R659 Cable with BNC-BNC Connectors (50 Lin. Ft.)	8	Each	$_____	$_____
668.1001	DTS Camera Site Equipment - Aiea Heights Drive	1	Each	$_____	$_____
668.1002	DTS Camera Site Equipment - Kaimakani Street	1	Each	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
668.1003	HDOT Camera Control Cabinet	5	Each	$_____	$_____
668.1004	Cabinet Concrete Base	6	Each	$_____	$_____
668.1005	Install State-Furnished Camera Site Equipment	5	Each	$_____	$_____
668.2001	Type "A" Pullbox	2	Each	$_____	$_____
668.2002	Type "B" Pullbox	6	Each	$_____	$_____
668.3003	16" Sq. x 8" D, Stainless Steel Junction Box	5	Each	$_____	$_____
668.4001	Fiber Optic Cable - 36 Strand Single-Mode	5,560	Lin. Ft.	$_____	$_____
668.4002	Fiber Optic Cable - 18 Strand Single-Mode/18 Strand Multi-Mode	950	Lin. Ft.	$_____	$_____
668.4003	Fiber Optic Cable - 18 Strand Single-Mode/18 Strand Multi-Mode with Messenger	2,600	Lin. Ft.	$_____	$_____
668.4004	Fiber Optic Connector Cable	3	Each	$_____	$_____
668.5001	Power Cable - 2#4, 1#6 Ground	1,190	Lin. Ft.	$_____	$_____
668.5002	Power Cable - 2#6, 1#8 Ground	600	Lin. Ft.	$_____	$_____
668.6001	CCTV Ductline - 1-4" PVC Schedule 40	250	Lin. Ft.	$_____	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
668.6002	CCTV Ductline - 1-2" PVC Schedule 40	1,420	Lin. Ft.	$_____	$_____
668.6003	CCTV Conduit - 1-2" PVC Coated GRS	1,070	Lin. Ft.	$_____	$_____
668.7000	HECO Meter Assembly	1	Each	$_____	$_____
668.8001	Fiber Optic Cable Splicing at HDOT-TOC	L.S.	L.S.	L.S.	$_____
668.9001	Cables Between Camera Control Cabinet and State-Furnished Camera	F.A.	F.A.	F.A.	$7,500.00
668.9002	Miscellaneous CCTV System Testing and Troubleshooting	F.A.	F.A.	F.A.	$50,000.00
670.1000	Glass Fiber Reinforced Polymer Rebar	L.S.	L.S.	L.S.	$_____
671.1000	Preconstruction Survey	L.S.	L.S.	L.S.	$_____
680.0100	Trenchless Sleeves for Systems Crossings	L.S.	L.S.	L.S.	$_____
681.1000	Furnishing Specialty Equipment	L.S.	L.S.	L.S.	$_____
681.1001	Tie Back Anchors for AW-1	24	Each	$_____	$_____
681.1002	Reinstallation of Tieback Anchors Due to Grout Loss and Additional Performance Tests for AW-1	F.A.	F.A.	F.A.	$40,000.00
694.0010	Moveable Concrete Barrier (MCB) System	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
695.0100	Moveable Concrete Barrier Transfer Machine (MCBTM)	L.S.	L.S.	L.S.	$_____
696.0100	Weigh-In-Motion System	L.S.	L.S.	L.S.	$_____
697.0010	5-Passenger Sport Wagon	72	Veh/Month	$_____	$_____
699.1000	Mobilization (Not to Exceed 10% of the Sum of All Items Excluding the Bid Price of This Item, Furnishing Drilled Shaft Equipment, Microcomputer System, Field Offices and Project Site Laboratory, Cellular Phone, Furnishing Jet Grouting Equipment, and Force Account Items).	L.S.	L.S.	L.S.	$_____
699.2000	Mobilization (Not to Exceed 10% of the Sum of All Items, Excluding the Bid Price of This Item and Force Account Items) (Austin-Bishop)	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE

	ITEM	APPROX QUANTITY	UNIT	UNIT PRICE	AMOUNT
a.	Sum of All Items				$_____
b.	Either Furnish Foreign Steel Not to Exceed Minimal Amount (Fill in '0') or Furnish Foreign Steel in Excess of Minimal Amount (Fill in 25% X a)				$_____
c.	SUBTOTAL				$_____
d.	Contract Time X Road User Cost _____ Calendar Days X $19,500.00/Calendar Day				$_____
e.	AMOUNT FOR COMPARISON OF BIDS (c+d)				$_____

NOTES: Bidders must complete items a through e, including the Contract Time, in calendar days. The Contract Time shall not exceed the maximum specified on Page P-1.

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

Proposal items for "Interstate Route H-1 Seismic Retrofit, Austin-Bishop Separation and Waiau Interchange, F.A.I.P. No. BR-H1-1(241)" project are indicated by "(Austin-Bishop)" in item description. All other items are for the "Interstate Route H-3, H-3 Finish (Unit VIII), F.A.I.P. No. I-H3-1(75) Unit VIII" project.

PROPOSAL SCHEDULE

The bidder is directed to Subsection 108.01 - Subletting of Contract.

The bidder's attention is directed to Sections 635 - Microcomputer System, 636 - Field Office and Project Site Laboratory, 638 - Cellular Phone, and 699 - Mobilization for the limitation of the amount bidders are allowed to bid.

If the bid price for any proposal item having a maximum allowable bid indicated therefor in any of the contract documents is in excess of such a maximum amount, the bid price for such proposal item shall be adjusted to reflect the limitation thereon. The comparison of bids to determine the successful bidder and the amount of contract to be awarded shall be determined after such adjustments are made, and such adjustments shall be binding upon the bidder.

The bidder is directed to Subsections 106.12 - Recycling of Waste Glass and 106.13 - Ordering of Certain Material.

INSTRUCTIONS TO COMPUTE THE AMOUNT FOR COMPARISON OF BIDS FOR FOREIGN STEEL

Each bidder shall indicate its intention to furnish foreign steel on this project by initialing after the AMOUNT for each of the items the bidder intends to use such foreign steel including lump sum items. A bidder not indicating such usage certifies that the bidder will furnish and use only domestic steel on this project. Also, the bidder shall add an additional 25% to the SUM OF ALL ITEMS if the bid submitted is based on furnishing foreign steel in excess of the minimal use specified in Subsection 106.11 - Domestic Materials.

SUPPLEMENT TO PROPOSAL SCHEDULE

The Department recognizes that certain items of material to be incorporated into the project and/or consumed in the prosecution of the project are temporarily in short supply and beyond the control and without the fault of the Contractor. The effect of such shortages has, among other things, resulted in periodic fluctuations in the posted prices of such short supply materials, thereby making the proposal difficult for the Contractor to bid with confidence.

For this project, the only materials considered to be in short supply and Sections involved herewith are tabulated below (See Proposal Schedule in regards to the Contract Items involved):

Section	Description	Short Supply Material
301	Plant Mix Asphalt Concrete Base Course	Asphalt Cement
302	Recycled Plant Mix Asphalt Concrete Base	Asphalt Cement
312	Plant Mix Glassphalt Concrete Base Course	Asphalt Cement
401	Asphalt Concrete Pavement	Asphalt Cement
407	Bituminous Tack Coat	Asphalt Cement
408	Prime Coat	Asphalt Cement
503	Concrete Structures	Portland Cement
602	Reinforcing Steel	Reinforcing Steel
603	Culverts and Storm Drains	Portland Cement Reinforcing Steel
604	Manholes, Inlets and Catch Basins	Portland Cement Reinforcing Steel
608	Sidewalks	Portland Cement Asphalt Cement
609	Curb and/or Gutter	Portland Cement Asphalt Cement
610	Reinforced Concrete Driveway	Portland Cement
650	Curb Ramp	Portland Cement

Each bidder shall submit with the proposal a written statement from the supplier of each short supply material indicating the supplier's current posted price, effective date of that price and the location of the material at that posted price (by island).

If the price of such short supply material is increased or decreased by more than 5% by the supplier prior to the completion of that contract item requiring the short supply material, the Contractor shall submit to the Department a written statement from the supplier indicating the effective date and changed price the Contractor will thereafter be charged for such short supply material. The Contractor shall also obtain whenever possible, quotations for furnishing the material from other available local suppliers. The quotations shall be obtained sufficiently in advance of the need for the material to allow review by the Department so as not to delay the work. The Contractor's request to the Department for adjusted compensation due to such changed prices will be computed only with prices in effect at the time of delivery. Only the lowest quotation obtained will be accepted by the Department. Transportation, handling, loading, processing and other similar costs will not be subject to adjusted compensation.

No adjustment to the unit bid prices will be made when the increase or decrease in the price of the short material is less than 5% of the original posted price.

If the adjustment to the unit bid price is decreased in the price of the short supply material by more than 5% of the original posted price, the State will be credited.

If an increase in the price of any short supply material exceeds or is scheduled to exceed 35% of the original posted price, the Contractor must notify the State within five working days before using the short supply material. Upon receipt of such notification from the Contractor, the State will direct the Contractor to either (1) authorize work to proceed as usual with the assurance that the indicated incremental price increase above the 35% will be compensable, (2) issue such change orders as the State may deem necessary to reduce further requirements of the short supply material which is to be paid at the increased price, or (3) if the material is considered to have priced itself beyond reason or beyond what the State can pay, the State may order cessation of further use of such short supply material on the project. Such notification by the Contractor will be required at each instance of incremental price increase above the 35% limit. If the Contractor fails to notify the State of any such incremental price increase within five working days before using the short supply material and continues to utilize the short supply material on the project, the State will not be responsible for payment for the incremental cost increase of which the State was not forewarned.

Computation for the adjusted compensation will be as follows:

(A) Portland Cement

If X = Adjustment per cubic yard of concrete,

P = Portland cement content of the approved mix design expressed in hundredweight per cubic yard of concrete,

Q = Increase or decrease in the price of portland cement in dollars per hundredweight,

Then X = QP

Example: Posted price of portland cement increases from $1.40 to $1.70 per cwt. and the hundredweight (cwt) of concrete is 5.6 cwt per c.y., then the adjustment shall be:

$$\$1.70 - \$1.40 = \$0.30$$
$$(\$1.40)(5\%) = \$0.07$$
$$\$0.30 - \$0.07 = \$0.23$$
$$X = (\$0.23)(5.6) = \$1.29 \text{ per c.y. of concrete}$$

(B) Asphalt Cement

If X = adjustment per ton of mix,

P = asphalt cement content, expressed in percent of dry weight of the aggregates, as determined and accepted by the Department for each of the design plant mixes,

Q = increase or decrease in the price of asphalt cement, in dollars per ton,

Then $X = \frac{Q(P)}{100+P}$

Example: Posted price of asphalt cement increases from $70 to $80 per ton and the asphalt content of the A.C. mix was accepted at 6.0%, then the adjustment shall be:

$$\$80.00 - \$70.00 = \$10.00$$
$$(\$70.00)(5\%) = \$3.50$$
$$\$10.00 - \$3.50 = \$6.50$$
$$X = \$6.50 \left(\frac{6}{100+6}\right) = \$0.37 \text{ per ton A.C. mix}$$

(C) Reinforcing Steel

If X = Adjustment for reinforcing steel,

P = Weight of reinforcing steel, expressed in hundredweight

Q = Increase or decrease in the price of reinforcing steel in dollars per hundred weight,

Then X = QP

Example: Posted price of grade 40 reinforcing steel increases from $14.00 to $15.00 per cwt and the weight of the grade 40 reinforcing steel is 80,000 pounds, then the adjustment shall be:

$15.00 - $14.00 = $1.00
($14.00)(5%) = $0.70
$1.00 - $0.70 = $0.30
X = ($0.30)(800) = $240 for grade 40 reinforcing steel

The Contractor shall submit to the Department original receipted bills covering the short supply material used on the project as soon as practicable after shipments are completed. The bills shall be accompanied by a tabulation on which the bills are listed in chronological order showing for each bill the quantity, the date shipped from the supplier's terminal and the price per unit at the place indicated in the posted price (reflecting any deduction for quantity shipments). These bills shall be subject to audit verification.

The Department reserves the right to alter the quantities of material to be furnished in accordance with the provisions of Subsection 104.02.

The Department also reserves the right, during construction, to decrease or increase the scope of work, because of limitations of funds, with no adjustment in unit prices other than that specified hereinabove.