

Amend **Section 622 - Roadway Lighting System** to read as follows:

**"SECTION 622 - ROADWAY LIGHTING SYSTEM**

**622.01 Description.** This work includes furnishing and installing an underground conduit system infrastructure to service the Utility Company's roadway lighting system, according to the contract and Kauai Island Utility Cooperative (KIUC) requirements.

This work includes furnishing and installing concrete foundations; conduits, fittings, pullboxes, and other conduit system infrastructure materials necessary for the support of the KIUC's roadway lighting system; installing KIUC furnished materials; coordinating and scheduling all work with KIUC; and demolishing and salvaging, as required, existing abandoned roadway lighting systems according to the contract.

Furnish and install the incidental parts necessary to complete the underground conduit system infrastructure as though the contract showed such parts.

Electrical equipment shall conform to the NEMA Standards. Material and workmanship shall conform to the latest requirements of the "National Electrical Code," herein referred as the Code; General Order Nos. 6 and 10, of the Hawaii Public Utilities Commission; the standards of the ASTM; the ANSI; Local Joint Pole Agreement; local power company rules; and local ordinances that may apply.

**622.02 Materials.** Materials shall conform to the following:

Welded Wire Fabric Reinforcement	709.01(C)
Conduits	712.27

Concrete shall conform to Section 601 - Structural Concrete and shall be Class B.

Materials will be subject to inspection. Failure of the Engineer to note faulty material or workmanship during construction will not relieve the responsibility of the Contractor for removing or replacing such materials and redoing the work at no cost to the State.

**622.03 Construction Requirements.**

**(A) Equipment List and Drawings.** Within 10 days following the award of the contract, the Contractor shall submit to the Engineer for acceptance 6 copies of a list of materials and equipment that the

Contractor will incorporate in the work. The list shall include the name of the manufacturer, size and catalog number of the unit, detailed scale drawings and wiring diagrams of special equipment, and proposed deviations from the contract. If required, submit for acceptance samples of the material that the Contractor will use at no cost to the State.

Upon completion of the work, submit an 'As Built' plan showing in detail construction changes.

**(B) Excavation and Backfill.** Excavation and backfill shall conform to Section 206 - Excavation and Backfill for Conduits and Structures.

Excavate carefully to prevent damage to pavements, sidewalks, and other improvements.

**(C) Installation.** Coordinate and schedule all work with KIUC.

**(1) Foundations.** Concrete for foundations of metal lamp posts shall be Class B.

Locations of metal lamp posts shown in the contract are approximate only. The Engineer will decide the exact location in the field.

Forms shall be true to the lines and grades as accepted. Forms shall be rigid and securely braced in place. Place the conduit ends and KIUC furnished anchor bolts in proper position, placed in proper height, and held in place by a KIUC furnished template until the concrete sets. Cure the concrete for not less than 72 hours.

**(2) Metal Lamp Standards.** Lamp post, complete with bracket arm, shall be furnished and installed by KIUC, with the following exception:

Install each KIUC furnished transformer base on a concrete foundation. Set base so that the pole shaft, furnished & installed by KIUC, shall be precisely vertical by adjusting the KIUC furnished two nuts on each anchor bolt.

After the transformer base is in its proper position, place the grout under the base plate shown in the contract. Form the exposed portions to present a neat appearance.

Grout includes one part by volume of portland cement and three parts of beach sand.

**(3) Luminaires.** Luminaires, complete with lamps, shall be furnished and installed by KIUC

**(4) Circuits.** Cables and wires, complete with splices, disconnect and protective devices, for the roadway lighting system shall be furnished and installed by KIUC.

Install pullwires in conduits to facilitate the installation of cables by KIUC. Before installing the pullwires, pull a wire brush, swab and mandrel through each conduit for the removal of extraneous matter and verification of the absence of obstructions and debris from the conduit system. Temporarily plug the ends of conduits to keep the interior clean during the construction

**(5) Bonding and Grounding.** Metallic lamp posts shall be secured mechanically and electrically to form a continuous system. Ground them effectively as specified in the Code and in the contract.

**(6) Pullboxes.** Install pullboxes at the locations shown in the contract.

Install pullboxes so that the covers are level with the curb or sidewalk grade or 1 inch above the existing ground or as directed by KIUC.

**(7) Conduits.** Lay the polyvinyl chloride (PVC) conduits carefully in trenches prepared to receive the conduits. Conduits under roadway areas and driveways shall be PVC, Schedule 80 or shown in the contract.

Lay the conduit that will be placed in concrete structure or encased in concrete to the required lines and grades. Support the conduit rigidly in place by masonry material, manufactured conduit spacers, or other accepted means. Wire the conduit so that the Contractor will not dislodge the conduit during the placing and tamping of the concrete. The thickness of the concrete around the conduits shall be shown in the contract. Use only hand shovels in compacting the concrete. Cure the concrete jackets for at least 72 hours before permitting vehicular traffic.

Install rigid PVC conduit according to Article 352 of the Code. PVC conduit connections shall be of the solvent-weld type. Make solvent-weld joints according to the conduit manufacturer's recommendations and as accepted by the Engineer. The Engineer will permit pre-assembling sections of conduit.

Make directional changes in non-metallic conduit runs such as bends and changes to clear obstructions with curved segments using accepted deflection couplings or with short lengths of straight ducts and couplings. The deflection angle between two adjacent lengths of duct shall not exceed 6° and the bends shall not have a radius of less than 12 times the nominal size of the conduit unless using factory-made ells.

Non-metallic conduits shall end in end bells.

Cap or plug and mark the ends of conduits shown or specified. Provide each conduit run with a 1/8 inch polyolefin line extending uninterrupted through handholes for the entire length of run. Double an additional 2 feet of polyolefin line back into the conduit at both ends of the run.

Ends of conduit runs shall extend at least 24 inches past the face of curb or edge of pavement, unless the ends end in pullboxes. Locate the ends accurately by special markers, markings on curbs or as specified by the Engineer.

Keep the interior of conduits clean during the construction. Plug the ends of conduits temporarily to keep the ends clear during construction. Install the conduits to drain toward a pullbox. The Contractor may consider a single run to drain toward both ends.

**(D) Electric Service.** Apply for electric service at each location shown in the contract and shall comply with the power company's requirements.

**(1)** The Engineer will unmeter the service according to Schedule F for multiple services.

The Engineer will pay for permanent service connections and installation charges made by the power company.

During reconstruction or other improvements of existing roadway lighting facilities, keep the existing roadway lighting system operational in its entirety during hours of darkness. Schedule the work accordingly and provide a temporary lighting system if necessary, to keep the project area illuminated during the hours of darkness.

**(2) Services Provided By KIUC.** KIUC shall be responsible for the following:

**(a)** Furnishing and installing lamp posts with brackets, luminaries, lamps, electrical conductors, splices, disconnect

and protective devices, and other materials necessary for operating and controlling the roadway lights.

(b) Furnishing transformer base, anchor bolts, leveling nuts and installation template for installation by Contractor.

(E) **Field Test.** Before acceptance of the work, make the following tests on lighting circuits, in the presence of the Engineer.

Provide a functional test to show that each part of the system functions according to the contract.

Correct the faults in the material or the installation revealed by these tests at no cost to the State. Repeat the tests until no fault appears.

(F) **Salvaging Electrical Equipment.** The contract directs the Contractor to Section 202 - Removal of Structures and Obstructions, regarding existing highway facilities. When shown in the contract or specified by the Engineer, remove and salvage the existing electrical equipment including luminaires, standards, mast arms, ballasts, transformers, service equipment, and pullboxes, otherwise the existing electrical equipment shall become the property of the Contractor and the Contractor shall remove and dispose of the existing electrical equipment at no cost to the State.

Underground conduits, conductors and foundations not reused in the work shall become the property of the Contractor. Remove them from the highway right-of-way at no cost to the State.

When abandoning a foundation in-place on outside the roadbed area, remove the top of the foundation, anchor bolts and conduits to a depth of 6 inches below the surface of the ground. Backfill the resulting hole with material equivalent to the surrounding material.

Salvage and stockpile the existing equipment removed and not reused in the work at the work site.

**622.04 Method of Measurement.** The Engineer will not measure the lighting system for payment.

**622.05 Basis of Payment.** The Engineer will pay for the accepted lighting system on a contract lump sum basis complete in place. The price includes full compensation for submitting the equipment list and drawing; saw cutting and repairing existing pavement; excavating the trench; furnishing and laying the raceways into the trench; furnishing conduit spacers and concrete encasement where required; furnishing and compacting backfill; restoring finish grade to match adjacent; salvaging existing materials where required; testing; and

furnishing labor, materials, equipment, tools, and incidentals necessary to complete the work.

The Engineer will consider full compensation for the accepted pullbox/handhole, including excavating and backfilling, as incidental to the associated contract item in the proposal complete in place.

The Engineer will consider full compensation for coordinating and scheduling work with KIUC as incidental to the associated contract item in the proposal.

The Engineer will consider full compensation for the accepted foundation for light post, including excavating and backfilling; forming; furnishing and placing reinforcing steel; mixing, placing, and curing the concrete; and setting the KIUC furnished transformer base and anchor bolts as incidental to the associated contract item in the proposal complete in place.

The Engineer will consider full compensation for additional materials and labor not specifically shown or called for that are necessary to complete the work as incidental to the associated contract item in the proposal

The Engineer will pay for hauling and stockpiling of salvaged materials and equipment off the right-of-way as specified by the Engineer as extra work according to Subsection 104.03 - Extra Work.

The Engineer will make payment under:

<b>Pay Item</b>	<b>Pay Unit</b>
Olohena Road Intersection Lighting System	Lump Sum
Kuhio Highway Intersection Lighting System	Lump Sum"

The Engineer will not make payment for KIUC work. The work includes furnishing pole transformer base, anchor bolts, leveling nuts, and installation template for installation by the Contractor; furnishing and installing metal lamp posts with brackets, luminaires, lamps, service and electrical conductors, and other materials and incidentals necessary for operating and controlling the roadway lighting system; and demolishing existing KIUC roadway lighting systems according to the contract and KIUC requirements.

**END OF SECTION**