## SECTION 623 – TRAFFIC SIGNAL SYSTEM

Make the following amendment to said Section:

**(I)** Amend **Subsection 623.03(C)(5) Vehicle Detectors** from line 241 to line 247 to read as follows:

"**(5) Vehicle Detectors.** Existing loop vehicle detectors are to remain in service, unless otherwise directed by the Engineer. No later than three weeks following NTP date, submit video detection system product literature to the Engineer for review and acceptance. Acceptable products are the following:

- Econolite Autoscope® Vision
- Flir Systems, Inc.- TrafiCam
- Iteris, Inc. – Vantage VersiCam

Detection system shall interface with the controller. Furnish and install video detection system at one intersection as indicated on the plans, including operational checks and transfer of warranty to the State. This work shall be included within the scope of work of the traffic signal system contract item for these intersections."

**(II)** Amend **Subsection 623.03(C)(6) Pull Boxes** by adding the following after line 253:

"Backfilling, compacting, and constructing minimum 4" thick Class A concrete around new pull box to match the immediate surrounding area shall be considered incidental to the various traffic signal work items."

**(III)** Amend **Subsection 623.03(C)(7) Conduits** by adding the following after line 328:

"Existing conduits are to remain in place, with the exception of damaged or broken conduits discovered and brought to the attention of the Engineer."

**(IV)** Amend **Subsection 623.03(C)(8) Conductors and Cables** from line 358 to line 374 to read as follows:

"Signal light conductors and cables shall not be cut. Waterproof, soldered tap splice shall be the sole method of splicing used. At a minimum, waterproofing shall consist of two layers of the following: electrical tape, rubberized tape, and Scotchkote™ or equivalent. Waterproof labeling or specific traffic signal phase shall be affixed at all exposed conductors. Termination in the controller cabinet on the post shall be by pressure connector."

**(V)** Amend **Subsection 623.03(C) Installation** by adding the following after line 452:

"**(15) Video Detectors.** Furnish, install and place into operation a vehicle detection system that detects vehicles by processing video images and providing detection outputs to the controller. The system shall include all equipment shown on the plans and any incidental items necessary for satisfactory operation and maintenance of the system. The video detection system shall be installed per the manufacturer's recommendations. All cable runs shall be continuous without splice from the cabinet to the camera."

**(VI)** Amend **Subsection 623.03(G) Other Services** from line 493 to line 555 to read as follows:

"**(G) Other Services.**

**(1)** Perform the following:

**(a)** Make soldered taps in pull boxes and cabinet locations pertaining to signal heads, pedestrian buttons, vehicle detectors, preemption detectors, and interconnect circuits.

**(b)** Install and program controller timings and conflict monitor cards.

**(c)** Before leaving factory, conduct, or have supplier conduct, documented factory testing in accordance with Caltrans requirements for each controller and cabinet. Dry-store controller assemblies. Perform second documented diagnostic testing procedure. If factory testing is satisfactory, cycle controller assembly through eight vehicle phases and four pedestrian phases for 120 continuous hours before field installation.

Test and document validation of controller, cabinet output and input, C1/C2/C20 operations, load switches, detector cards, dc cards, modems, flash condition, time source, preemption system, and conflict monitor. Have necessary testing hardware and software to perform accurate and dependable test and validation of output signal displays, controller and cabinet functions, and conflict monitor certification.

**(d)** Install controller assembly including anchor bolts, seals, grout, rerouted cables, extended power cables, ground wires, signal cables, and other adjustments to base, conduits, and cabinet for fully operational system.

**(e)** Remove and properly dispose of existing cabinets, standards, signal heads, traffic signs, pushbutton assemblies,

meter pedestals, pull boxes, back plates, conductors, and hardware that have been replaced with new, at no cost to the State."

**(VII)** Amend **Section 623.04 - Measurement** by replacing lines 578 to 579 to read:

"**623.04 Measurement.** The Engineer will not measure software for controller, interconnect, or electrical risers for payment.

(A) The Engineer will measure the controller assembly, foundation for traffic signal controller, traffic signal standard, foundation for traffic signal standard, pedestrian or traffic signal assembly, pedestrian pushbutton, pullbox, loop detector sensing unit, emergency vehicle preemption optical receiver, service and metering equipment assembly, and advance warning beacon assembly per each in accordance with the contract documents.

(B) The Engineer will measure EVP cable, traffic signal interconnect subduct, traffic signal ductline, secondary electrical ductline and conductors per linear foot from center of device to center of device or from station to station.

(C) The Engineer will measure Hawaiian Electric Company service connection fees and transformer installation on a force account basis according to Subsection 109.06 – Force Account Provisions and Compensation."

**(VIII)** Amend **Section 623.05 – Payment** by replacing lines 581 to 594 to read:

"**623.05 Payment.** The Engineer will pay for the controller assembly at the contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing; furnishing and mounting the controller cabinet; furnishing, assembling, wiring, software, and housing the controller and auxiliary equipment; painting the controller cabinet; testing; providing turn-on service; submitting warranty; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the traffic signal standard at the contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing; furnishing and installing the traffic signal standard; wiring; bonding and grounding; testing; providing turn-on service; submitting warranty; and furnishing equipment, tools, labor, materials; and other incidentals necessary to complete the work.

The Engineer will pay for the foundation for controller cabinet and traffic signal standard at the contract unit price per each complete in place. The price includes full compensation for excavating and backfilling; forming; furnishing and

placing the reinforcing steel; mixing, placing, and curing the concrete; furnishing and setting the anchor bolts; restoring the pavement; and furnishing equipment, tools, materials and other incidentals necessary to complete the work.

The Engineer will pay for the pedestrian and traffic signal assembly at the contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing; assembling the signal heads; wiring; bonding and grounding; painting the signal head mounting; testing; providing turn-on service; submitting warranty; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the pedestrian pushbutton with instruction sign at the contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing; furnishing and installing the pedestrian pushbutton with the instruction sign; wiring; bonding and grounding; testing; providing turn-on service; submitting warranty; and furnishing equipment, tools, labor, materials; and other incidentals necessary to complete the work.

The Engineer will pay for the pullbox at the contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing; furnishing and installing the pullbox at the designated locations; saw cutting; excavating and backfilling; restoration of concrete sidewalks, asphalt concrete pavement and landscaping; coating the frames and covers; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the loop detector sensing unit at the contract unit price per each complete in place. The price includes full compensation for saw cutting; cleaning and blowing the saw cut areas; furnishing and inserting the loop cable; splicing in the pullbox; filling the saw cut groove with epoxy sealer or hot applied rubberized sealant; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will not pay for the interconnect or electrical risers. The work includes furnishing and installing the riser; and furnishing equipment, tools, labor, materials, and other incidentals necessary to complete the work. The Engineer will consider the cost for risers as included in the contract price for the various contract items.

The Engineer will pay for the emergency vehicle preemption (EVP) optical receiver at the contract unit price per each complete in place. The price includes full compensation for submitting the equipment list and drawing; furnishing and installing the EVP; wiring; bonding and grounding; testing; providing turn-on service; submitting warranty; and furnishing equipment, tools, labor, materials; and other incidentals necessary to complete the work.

The Engineer will pay for the EVP cable at the contract unit price per linear foot complete in place. The price includes full compensation for furnishing and installing the preemption detector cable from the detector to the cabinet; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the video detection system at the contract unit price per each intersection installation complete in place. The price includes full compensation for furnishing, installing, and placing into operation a vehicle detection system including all equipment and materials shown on the plans and listed in the specification and any incidental items necessary for satisfactory operation and maintenance of the system.

The Engineer will pay for the traffic signal ductlines at the contract unit price per linear foot complete in place. The price includes full compensation for saw cutting; trenching; excavating and backfilling, including asphalt concrete pavement, aggregate base course and aggregate subbase course for trench repair; concrete curb and/or gutter and concrete sidewalk repair; furnishing, installing, bonding, and grounding the conduits and interconnect subducts; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the traffic signal interconnect subduct at the contract unit price per linear foot complete in place. The price includes full compensation for furnishing and installing; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the traffic signal cables at the contract unit price per linear foot complete in place. The price includes full compensation for furnishing, installing, splicing, and taping the cable; furnishing and installing interconnect fabric subducts; making the connections; providing turn-on service; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the service and metering equipment assembly at the contract unit price per each complete in place. The price includes full compensation for furnishing and installing the meter/main safety socket box, pullbox, support structure, ground rod, conduit, conductors; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for Hawaiian Electric Company service connection fees and transformer installation on a force account basis according to Subsection 109.06 – Force Account Provisions and Compensation. An estimate amount for the force account is allocated in the proposal schedule under Hawaiian Electric Company Service Connection Fees and Transformer Installation Fees. The actual amount to be paid will be the sum shown on the

accepted force account records whether this sum be more or less than the estimated amount allocated in the proposal schedule.

The Engineer will pay for the accepted advance warning beacon assembly at the contract unit price per each complete in place. The price includes full compensation for furnishing and installing the advance warning beacon from the beacon to the meter, and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will pay for the secondary electrical ductline at the contract price per linear foot complete in place. The price includes full compensation for saw cutting, excavating and backfilling; furnishing, installing, grounding, terminating conductors; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

The Engineer will consider full compensation for additional materials and labor not shown in the contract that are necessary to complete the installation of the various systems incidental to the various contract items. The Engineer will not allow additional compensation.

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

| **Pay Item** | **Pay Unit** |
|---|---|
| Controller Assembly with Software | Each |
| Type _____ Traffic Signal Standard _____ | Each |
| Foundation for _____ | Each |
| _____ Signal Assembly _____ | Each |
| Pedestrian Pushbutton with Instruction Sign | Each |
| _____ Type _____ Pullbox | Each |
| Loop Detector Sensing Unit (6 Ft. x 6 Ft.) _____ Loops | Each |
| EVP Optical Receiver with _____ | Each |
| Video Detection System | Each |
| Traffic Signal Ductline _____ | Lin. Ft. |
| Interconnect Fabric Subduct | Lin. Ft. |

| | | |
|---|---|---|
| EVP Cable | | Lin. Ft. |
| No. _____, _____ Cable | | Lin. Ft. |
| Service and Metering Equipment Assembly | | Each" |

**END OF SECTION 623**