STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ADDENDUM NO. 1
for
VOLCANO ROAD TEMPORARY SIGNAL INSTALLATION AT KIPIMANA STREET
PROJECT NO. 11N-01-19M

The following amendments shall be made to the Bid Documents:

A. NOTICE TO BIDDERS

1. Delete the Notice to Bidders and replace it with the attached Notice to Bidders dated 6/10/19.

B. SPECIFICATIONS

1. Delete the Table of Contents in its entirety and replace it with the attached Table of Contents dated 6/10/19.

2. Delete the Section 101 in its entirety and replace it with the attached Section 101 dated 6/10/19.

3. Delete the Section 105 in its entirety and replace it with the attached Section 105 dated 6/10/19.

4. Delete the Section 107 in its entirety and replace it with the attached Section 107 dated 6/10/19.

5. Delete the Section 108 in its entirety and replace it with the attached Section 108 dated 6/5/19.

6. Delete the Section 109 in its entirety and replace it with the attached Section 109 dated 6/10/19.

7. Delete the Section 201 in its entirety and replace it with the attached Section 201 dated 6/10/19.

8. Delete the Section 209 in its entirety and replace it with the attached Section 209 dated 6/10/19.

9. Delete the Section 301 in its entirety and replace it with the attached Section 301 dated 6/10/19.

10. Delete the Section 401 in its entirety and replace it with the attached Section 401 dated 6/10/19.

11. Delete the Section 615 in its entirety and replace it with the attached Section 615 dated 6/10/19.

12. Delete the Section 623 in its entirety and replace it with the attached Section 623 dated 6/10/19.

13. Delete the Section 627 in its entirety and replace it with the attached Section 627 dated 6/10/19.

14. Delete the Section 632 in its entirety and replace it with the attached Section 632 dated 6/10/19.

15. The attached Section 636 – Bolt Down Curbing with Delineators dated 6/7/19 shall be added and made a part of the Specifications.

16. Delete the Section 750 in its entirety and replace it with the attached Section 750 dated 6/10/19.

17. Delete the Section 755 in its entirety and replace it with the attached Section 755 dated 6/10/19.

18. Delete the Section 770 in its entirety and replace it with the attached Section 770 dated 6/10/19.

C. PROPOSAL

1. Delete the Proposal Schedule pages P-11 to P-13 and replace them with the attached Proposal Schedule pages P-11 to P-13 dated 6/10/19.

D. PLANS

1. Delete Plan Sheet Nos. 2, 4, 7, 8, 9, 10, 11, 12, 13, 14, 15 and 16 in their entirety and replace them with the attached Plan Sheet Nos. ADD. 2, ADD 4, ADD. 7, ADD. 8, ADD. 9, ADD. 10, ADD. 11, ADD. 12, ADD. 13, ADD. 14, ADD. 15 and ADD. 16.

The following is provided for information.

E. PRE-BID MEETING MINUTES

1. Meeting minutes are attached for your information.

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

JADE T. BUTAY
Director of Transportation

NOTICE TO BIDDERS

(Chapter 103D, HRS)

SEALED BIDS for:

Volcano Road
Temporary Signal Installation at Kipimana Street
11N-01-19M
District of Puna
Island of Hawaii

will be received at the:

__x__ Contracts Office, Department of Transportation
869 Punchbowl Street, Honolulu, Hawaii 96813

__x__ Office of the District Engineer – Hawaii
50 Makaala Street, Hilo, Hawaii 96720

until 2:00 P.M. Hawaii Standard Time, June 21, 2019 at which time and place(s) they will be publicly opened and read.

Plans, specifications, proposal, and contract forms are available at: http://hidot.hawaii.gov/administration/con/. Bids (hard copies) shall be submitted in a sealed envelope and shall be on the Proposal Form provided in the specifications. Bids received after the established due date and time will not be considered.

The project includes the installation of temporary traffic signals and associated electrical equipment, restriping and signage. Estimated construction cost is $500,000 to $1,000,000.

To be eligible to bid, bidders must possess a valid State of Hawaii General Engineering Contractor's "A" license prior to bidding.

The Hawaii Products Preference pursuant to Act 175, SLH 2009, is applicable to this project. Persons wishing to certify and qualify a product as a Hawaii Product shall submit a Certification for Hawaii Product Preference (SPO-Form 38) to the DOT Contracts office no later than 4:30 P.M., fourteen (14) calendar days prior to the bid opening date. Late submittals for this project will not be reviewed by the DOT. A separate SPO-Form 38 shall be completed and submitted for each product. Forms are available at http://spo.hawaii.gov/all-forms/.

A 5% bid adjustment for bidders that are parties to apprenticeship agreements pursuant to Section 103-55.6, Hawaii Revised Statutes (HRS), is applicable to this project.

Compliance with Act 192, SLH 2011 is a requirement whereby a minimum of 80% of the bidder's work force on this project **must** consist of Hawaii residents.

A pre-bid conference is scheduled for 9:00 A. M. June 5, 2019 at the Highways Division, Hawaii District Office, 50 Makaala Street, Hilo, Hawaii 96720 . All prospective bidders or their representatives (employees) are encouraged to attend, but attendance is not mandatory. Persons needing special accommodations at the pre-bid conference due to a disability may contact Project Manager Julann Sonomura, by phone at (808) 933-8866, by email at Julann.M.Sonomura@hawaii.gov, or by facsimile at (808) 933-8869.

ALL requests for information (RFI) shall be received in writing (email is

preferred) no less than 14 calendar days before bid opening. Questions received after the deadline will not be addressed. Verbal requests for information will not receive a response. All meeting attendees should bring their questions in writing to the meeting. Anything said at the conference is for clarification purposes and any changes to the bid documents will be made by addendum.

Campaign contributions by State and County Contractors. Contractors are hereby notified of the applicability of Section 11-355, HRS, which states that campaign contributions are prohibited from specified State or county government contractors during the term of the contract if the contractors are paid with funds appropriated by the legislative body. For more information, contact the Campaign Spending Commission at (808) 586-0285.

Any protest of this solicitation shall be submitted in writing to the Director of Transportation, in accordance with §103D-701, HRS and §3-126, HAR.

The U.S. Department of Transportation Regulation entitled "Nondiscrimination in Federally-Assisted Programs of the U.S. Department of Transportation," Title 49, Code of Federal Regulations (CFR), Part 21 is applicable to this project. Bidders are hereby notified that the Department of Transportation will affirmatively ensure that the contract entered into pursuant to this advertisement will be awarded to the lowest responsible bidder without discrimination on the grounds of race, color, national origin or sex (as directed by 23 CFR Part 200).

The Equal Employment Opportunity Regulations of the Secretary of Labor implementing Executive Order 11246, as amended, shall be complied with on this project.

Driving While Impaired (DWI) Education. HDOT encourages all organizations contracted with the DOT to have an employee education program preventing DWI. DWI is defined as operating a motor vehicle while impaired by alcohol or other legal or illegal substances. HDOT promotes this type of program to accomplish our mission to provide a safe environment for motorists, bicyclists and pedestrians utilizing our State highways, and expects its contractors to do so as well.

For additional information on this project, contact Julann Sonomura at (808) 933-8866, or by mail at 50 Makaala Street, Hilo, Hawaii 96720.

The State reserves the right to reject any or all proposals and to waive any defects in said proposals for the best interest of the public.

JADE T. BUTAY
Director of Transportation

Internet Posting: May 31, 2019

TABLE OF CONTENTS

END OF TABLE OF CONTENTS

Amend **Section 101 - TERMS, ABBREVIATIONS, AND DEFINITIONS** to read as follows:

"DIVISION 100 - GENERAL PROVISIONS

SECTION 101 - TERMS, ABBREVIATIONS, AND DEFINITIONS

101.01 Meaning of Terms. The specifications are generally written in the imperative mood. In sentences using the imperative mood, the subject, "the Contractor shall", is implied. In the material specifications, the subject may also be the supplier, fabricator, or manufacturer supplying material, products, or equipment for use on the project. The word "will" generally pertains to decisions or actions of the State.

When a publication is specified, it refers to the most recent date of issue, including interim publications, before the bid opening date for the project, unless a specific date or year of issue is provided.

101.02 Abbreviations. Meanings of abbreviations used in the specifications, on the plans, or in other contract documents are as follows:

AAN	American Association of Nurserymen
AASHTO	American Association of State Highway and Transportation Officials
ACI	American Concrete Institute
ADA	Americans with Disabilities Act
ADAAG	Americans with Disabilities Act Accessibility Guidelines
AGC	Associated General Contractors of America
AIA	American Institute of Architects
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
ANSI	American National Standards Institute
APA	American Plywood Association
ARA	American Railway Association

AREA	American Railway Engineering Association
ASA	American Standards Association
ASCE	American Society of Civil Engineers
ASLA	American Society of Landscape Architects
ASTM	American Society for Testing and Materials
AWG	American Wire Gauge
AWPA	American Wood Preserver's Association
AWS	American Welding Society
AWWA	American Water Works Association
BMP	Best Management Practice
CCO	Contract Change Order
CFR	Code of Federal Regulations
CRSI	Concrete Reinforcing Steel Institute
DCAB	Disability and Communication Access Board, Department of Health, State of Hawaii
DOTAX	Department of Taxation, State of Hawaii
EPA	U.S. Environmental Protection Agency
FHWA	Federal Highway Administration, U.S. Department of Transportation
FSS	Federal Specifications and Standards, General Services Administration, U.S. Department of Defense
HAR	Hawaii Administrative Rules
HDOT	Department of Transportation, State of Hawaii
HIOSH	Occupational Safety and Health, Department of Labor and Industrial Relations, State of Hawaii

HMA	Hot Mix Asphalt
HRS	Hawaii Revised Statutes
ICEA	Insulated Cable Engineers Association (formerly IPCEA)
IMSA	International Municipal Signal Association
IRS	Internal Revenue Service
ITE	Institute of Transportation Engineers
MTRB	Material Testing and Research Branch (HWY-L)
MUTCD	Manual on Uniform Traffic Control Devices for Streets and Highways, FHWA, U.S. Department of Transportation
NCHRP	National Cooperative Highway Research Program
NEC	National Electric Code
NEMA	National Electrical Manufacturers Association
NFPA	National Forest Products Association
NPDES	National Pollutant Discharge Elimination System
OSHA	Occupational Safety and Health Administration/Act, U.S. Department of Labor
SAE	Society of Automotive Engineers
SI	International Systems of Units
UFAS	Uniform Federal Accessibility Standards
UL	Underwriter's Laboratory
USGS	U.S. Geological Survey
VECP	Value Engineering Cost Proposal

101.03 Definitions. Whenever the following words, terms, or pronouns are used in the contract documents, unless otherwise prescribed therein and without regards to the use or omission of uppercase letters, the intent and meaning shall be interpreted as follows:

Addendum (plural - Addenda) - A written or graphic document, including drawings and specifications, issued by the Director during the bidding period. This document modifies or interprets the bidding documents by additions, deletions, clarifications or corrections.

Addition (to the contract sum) - Amount added to the contract sum by change order.

Advertisement - A public announcement inviting bids for work to be performed or materials to be furnished.

Amendment - A written document issued to amend the existing contract between the State and Contractor and properly executed by the Contractor and Director.

Award - Written notification to the bidder that the bidder has been awarded a contract.

Bad Weather Day (or Unworkable Day) - A day when weather or other conditions prevent a minimum of four hours of work with the Contractor's normal work force on critical path activities at the site.

Bag - 94 pounds of cement.

Barrel - 376 pounds of cement.

Base Course - The layer or layers of specified material or selected material of a designed thickness placed on a subbase or subgrade to support a surface course.

Basement Material - The material in excavation or embankments underlying the lowest layer of subbase, base, pavement, surfacing or other specified layer.

Bid - See Proposal.

Bidder - An individual, partnership, corporation, joint venture or other legal entity submitting, directly or through a duly authorized representative or agent, a proposal for the work or construction contemplated.

Bidding Documents (or Solicitation Documents) - The published solicitation notice, bid requirements, bid forms and the proposed contract documents including all addenda and clarifications issued prior to receipt of the bid.

Bid Security - The security furnished by the bidder from which the State may recover its damages in the event the bidder breaches its promise to enter into a contract with the State, or fails to execute the required bonds covering the work contemplated, if its proposal is accepted.

Blue Book - EquipmentWatch Cost Recovery (formerly known as EquipmentWatch Rental Rate Blue Book), available from EquipmentWatch, a division of Penton, Inc.

Calendar Day - See Day.

Change Order (or Contract Change Order) - A written order signed by the Engineer issued with or without the consent of the Contractor directing changes in the work, contract time or contract price. The purposes of a change order include, but are not limited to (1) establishing a price or time adjustment for changes in the work; (2) establishing full payment for direct, indirect, and consequential costs, including costs of delay; (3) establishing price adjustment or time adjustment for work covered and affected by one or more field orders; or (4) settling Contractor's claims for direct, indirect, and consequential costs, or for additional contract time, in whole or in part.

Completion - See Substantial Completion and Final Completion.

Completion Date - The date specified by the contract for the completion of all work on the project or of a designated portion of the project.

Comptroller - the Comptroller of the State of Hawaii, Department of Accounting and General Services.

Contract - The written agreement between the Contractor and the State, by which the Contractor shall provide all labor, equipment, and materials and perform the specified work within the contract time stipulated, and by which the State of Hawaii is obligated to compensate the Contractor at the prices set forth in the contract documents.

Contract Certification Date - The Date on which the Deputy Comptroller for the State of Hawaii (or authorized representative) signs the Contract Certification.

Contract Completion Date - The calendar day on which all work on the project, required by the contract, must be completed. See CONTRACT TIME.

Contract Documents - The contract, solicitation, addenda, notice to bidders, Contractor's bid proposal (including wage schedule, list of subcontractors and other documentations accompanying the bid), notice to proceed, bonds, Standard Specifications, special provisions, specifications, drawings, all modifications, all written amendments, change orders, field orders, orders for minor changes in the work, the Engineer's written interpretations and clarifications issued on or after the effective date of the contract.

Contract Item (Pay Item) - A specific unit of work for which there is a price in the contract.

Contract Modification (Modification) - A change order that is mutually agreed to and signed by the parties to the contract.

Contract Price - The amount designated on the face of the contract for the performance of work.

Contract Time (or Contract Duration) - The number of calendar or working days provided for completion of the contract, inclusive of authorized time extensions. Contract time shall commence on the Start Work Date and end on the Substantial Completion Date. If in lieu of providing a number of calendar or working days, the contract requires completion by a certain date, the work shall be completed by that date.

Contracting Officer - See Engineer.

Contractor - Any individual, partnership, firm, corporation, joint venture, or other legal entity undertaking the execution of the work under the terms of the contract with the State.

Critical Path - Longest logical sequence of activities that must be completed on schedule for the entire project to be completed on schedule.

Day - Any day shown on the calendar, beginning at midnight and proceeding up to, but not including, midnight the following day. If no designation of calendar or working day is made, "day" shall mean calendar day.

Department - The Department of Transportation of the State of Hawaii (abbreviated HDOT).

Director - The Director of the HDOT acting directly or through duly authorized representatives.

Plans (or Drawings) - The contract drawings in graphic or pictorial form including the notes, tables and other notations thereon indicating the design, location, character, dimensions, and details of the work.

Engineer - The Highway Administrator, Highways Division, HDOT, or the authorized person delegated to act on the Administrator's behalf.

Equipment - All machinery, tools, and apparatus needed to complete the contract.

Field Order - A written order issued by the Engineer or the Engineer's authorized representative to the Contractor requiring a change or changes to the contract work. A field order may (1) establish a price adjustment or time adjustment; or (2) may declare that no adjustment will be made to contract price or contract time;

or (3) may request the Contractor to submit a proposal for an adjustment to the contract price or contract time.

Final Acceptance - The Status of the project when the Engineer finds that the Contractor has satisfactorily completed all contract work in compliance with the contract including all plant establishment requirements, and all the materials have been accepted by the State.

Final Completion - The date set by the Director that all work required by the contract has been completed in full compliance with the contract documents.

Final Inspection - Inspection where all contract items (with the exception of Planting Period and Plant Establishment Period) are accepted by the Engineer. Substantial Completion will be issued by the Engineer based on the satisfactory results of the Final Inspection.

Float - The amount of time between when an activity can start and when an activity must start, i.e., the time available to complete non-critical activities required for the performance of the work without affecting the critical path.

Guarantee - Legally enforceable assurance of the duration of satisfactory performance of quality of a product or work.

Hawaii Administrative Rules - Rules adopted by the State in accordance with Chapter 91 of the Hawaii Revised Statutes, as amended.

Highway (Street, Road, or Roadway) - A public way within a right-of-way designed, intended, and set aside for use by vehicles, bicyclists, or pedestrians.

Highways Division - The Highways Division of the Hawaii Department of Transportation constituted under the laws of Hawaii for the administration of highway work.

Holidays - The days of each year which are set apart and established as State holidays pursuant to Chapter 8 of the Hawaii Revised Statutes, as amended.

Inspector - The Engineer's authorized representative assigned to make detailed inspections of contract performance, prescribed work, and materials supplied.

Laboratory - The testing laboratory of the Highways Division or other testing laboratories that may be designated by the Engineer.

Laws - All Federal, State, and local laws, executive orders and regulations having the force of law.

Leveling Course - An aggregate mixture course of variable thickness used to restore horizontal and vertical uniformity to existing pavements or shoulders.

Liquidated Damages - The amount prescribed to be paid to the State or to be deducted from any payments payable to or, which may become payable to the Contractor.

Lump Sum (LS) - When used as a payment method means complete payment for the item of work described in the contract documents.

Material - Any natural or manmade substance or item specified in the contract to be incorporated in the work.

Notice to Bidders - The advertisement for proposals for all work or materials on which bids are required. Such advertisement will indicate the location of the work to be done or the character of the material to be furnished and the time and place for the opening of proposals.

Notice to Proceed - Written notice from the Engineer to the Contractor identifying the date on which the Contractor is to begin procuring materials and required permits and adjusting work forces, equipment, schedules, etc. prior to beginning physical work.

Pavement - The uppermost layer of material placed on the traveled way or shoulders or both. Pavement and surfacing may be interchangeable.

Pavement Structure - The combination of subbase, base, pavement, surfacing or other specified layer of a roadway constructed on a subgrade to support the traffic load.

Payment Bond - The security executed by the Contractor and surety or sureties furnished to the Department to guarantee payment by the Contractor to laborers, material suppliers and subcontractors in accordance with the terms of the contract.

Physical Work - Physical construction activities on the project site or at appurtenant facilities including staging areas. It includes (i) building or installing any structures or facilities including, but not limited to sign erection; BMP installation; field office site grading and building; (ii) removal, adjustment, or demolition of physical obstructions on site; (iii) any ground breaking activities; and (iv) any utility work. It does not include pre-construction environmental testing (such as water quality baseline measurements) that may be required as part of contract.

Pre-Final Inspection - Inspection scheduled when Contractor notifies Engineer that all physical work on the project, with the exception of planting period and plant establishment period, has been completed. Notice from Contractor of substantial completion will suspend contract time until Contractor receives punchlist from Engineer.

Profile Grade - The elevation or gradient of a vertical plane intersecting the top surface of the proposed pavement.

Project Acceptance Date - The calendar day on which the Engineer accepts the project as completed. See Final Completion.

Proposal (Bid) - The executed document submitted by a Bidder in response to a solicitation request, to perform the work required by the proposed contract documents, for the price quoted and within the time allotted.

Public Traffic - Vehicular or pedestrian movement on a public way.

Punchlist - A list compiled by the Engineer specifying work yet to be completed or corrected by the Contractor in order to substantially complete the contract.

Questionnaire - The specified forms on which the bidder shall furnish required information as to its ability to perform and finance the work.

Request for Change Proposal - A written notice from the Engineer to the Contractor requesting that the Contractor provide a price and/or time proposal for contemplated changes preparatory to the issuance of a field order or change order.

Right-of-Way - Land, property, or property interests acquired by a government agency for, or devoted to transportation purposes.

Roadbed - The graded portion of a highway within top and side slopes, prepared as a foundation for the pavement structure and shoulders.

Roadside - The area between the outside edges of the shoulders and the right-of-way boundaries. Unpaved median areas between inside shoulders of divided highways and infield areas of interchanges are included.

Section and Subsection - Section or subsection shall be understood to refer to these specifications unless otherwise specified.

Shop Drawings - All drawings, diagrams, illustrations, schedules and other data or information which are specifically prepared or assembled by or for the Contractor and submitted by the Contractor to illustrate some portion of the work.

Shoulder - The portion of the roadway next to the traveled way for: accommodation of stopped vehicles, placement of underground facilities, emergency use, and lateral support of base and surface courses.

Sidewalk - That portion of the roadway primarily constructed for use by pedestrians.

Solicitation - An invitation to bid or request for proposals or any other document issued by the Department to solicit bids or offers to perform a contract. The solicitation may indicate the time and place to receive the bids or offers and the location, nature and character of the work, construction or materials to be provided.

Specifications - Compilation of provisions and requirements to perform prescribed work.

(A) Standard Specifications. Specifications by the State intended for general application and repetitive use.

(B) Special Provisions. Revisions and additions to the standard specifications applicable to an individual project.

Standard Plans - Drawings provided by the State for specific items of work approved for repetitive use.

State - The State of Hawaii, its Departments and agencies, acting through its authorized representative(s).

State Waters – All waters, fresh, brackish, or salt, around and within the State, including, but not limited to, coastal waters, streams, rivers, drainage ditches, ponds, reservoirs, canals, ground waters, and lakes; provided that drainage ditches, ponds, and reservoirs required as a part of a water pollution control system are excluded.

Start Work Date - Date on which Contractor begins physical work on the contract. This date shall also be the beginning of Contract Time.

Structures - Bridges, culverts, catch basins, drop inlets, retaining walls, cribbing, manholes, endwalls, buildings, sewers, service pipes, underdrains, foundation drains, and other such features that may be encountered in the work.

Subbase - A layer of specified material of specified thickness between the subgrade and a base.

Subcontract - Any written agreement between the Contractor and its subcontractors which contains the conditions under which the subcontractor is to perform a portion of the work for the Contractor.

Subcontractor - An individual, partnership, firm, corporation, or joint venture or other legal entity, as covered in Chapter 444 of the Hawaii Revised Statutes, as amended, which enters into an agreement with the Contractor to perform a portion of the work.

Subgrade - The top surface of completed earthwork on which subbase, base, surfacing, pavement, or a course of other material is to be placed.

Substantial Completion - The Status of the project when the Contractor has completed the work, except for the planting period and plant establishment period, and each of the following requirements are met:

(1) All traffic lanes (including shoulders, ramps, sidewalks and bike paths) are in their final configuration as designed and the final wearing surface and all required permanent pavement markings, words, symbols, etc. have been installed;

(2) All operational and safety devices have been installed in accordance with the contract documents including guardrails, end treatments, traffic barriers, required signs and pavement markings, drainage, parapet, and bridge and pavement structures;

(3) All required illumination and lighting for normal and safe use and operation is installed and functional in accordance with the contract documents;

(4) All utilities and services are connected and working;

(5) The need for temporary traffic controls or lane closures at any time has ceased, except for lane closures required for routine maintenance;

(6) The building, structure, improvement or facility can be used for its intended purpose.

Substantial Completion Date - The date the Substantial Completion is granted by the Engineer in Writing and Contract Time stops.

Superintendent - The employee of the Contractor who is responsible for all the work and is a Contractor's agent for communications to and from the State.

Surety - The qualified individual, firm or corporation other than the Contractor, which executes a bond with and for the Contractor to insure its acceptable performance of the contract.

Surfacing - The uppermost layer of material placed on the traveled way or shoulders. This term is used interchangeably with pavement.

Traveled Way - The portion of the roadway for the movement of vehicles, exclusive of shoulders.

Unsuitable Material - Materials that contain organic matter, muck, humus, peat, sticks, debris, chemicals, toxic matter, or other deleterious materials not suitable for use in earthwork.

Utility - A line, facility, or system for producing, transmitting, or distributing communications, power, electricity, heat, gas, oil, water, steam, waste, or storm water.

Utility Owner - The entity, whether private or owned by a State, Federal, or County governmental body, that has the power and responsibility to grant approval for, or undertake construction work involving a particular utility.

Water Pollutant - Dredged spoil, solid refuse, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical waste, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, soil, sediment, cellar dirt and industrial, municipal, and agricultural waste.

Water Pollution - (1) Such contamination or other alteration of the physical, chemical, or biological properties of any state waters, including change in temperature, taste, color, turbidity, or odor of the waters, or **(2)** Such discharge of any liquid, gaseous, solid, radioactive, or other substances into any state waters, as will or is likely to create a nuisance or render such waters unreasonably harmful, detrimental, or injurious to public health, safety, or welfare, including harm, detriment, or injury to public water supplies, fish and aquatic life and wildlife, recreational purposes and agricultural and industrial research and scientific uses of such waters or as will or is likely to violate any water quality standards, effluent standards, treatment and pretreatment standards, or standards of performance for new sources adopted by the Department of Health.

Work - The furnishing of all labor, material, equipment, and other incidentals necessary or convenient for the successful execution of all the duties and obligations imposed by the contract.

Working Day - A calendar day in which a Contractor is capable of working four or more hours with its normal work force, exclusive of:

(1) Saturdays, Sundays, and recognized legal State holidays and such other days specified by the contract documents as non-working days,

(2) Day in which the Engineer suspends work for four or more hours through no fault of the Contractor."

END OF SECTION 101

SECTION 105 – CONTROL OF WORK

Make the following amendments to said Section:

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

"**105.01 Authority.**

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

(1) Interpretation of the contract documents.

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

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

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

(5) Compensation under the contract.

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

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

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

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

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

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

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

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

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

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

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

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

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

Section No.	Description
401	Contract Item No. 401.0000 under Section 401 – Hot Mix Asphalt Pavement
623	All Contract Items under Section 623 - Traffic Signal System
629	All Contract Items under Section 629 - Pavement Markings
631	All Contract Items under Section 631 - Traffic Control Regulatory, Warning, and Miscellaneous Signs
632	All Contract Items under Section 632 - Markers
645	Contract Item No. 645.1000 under Section 645 – Traffic Control"

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

"Contractors may enter into subcontracts only with subcontractors listed in the proposal or with non-listed joint contractors/subcontractors permitted under Subsection 102.05 – Examination of Contract and Site of Work."

END OF SECTION 105

SECTION 107 - LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

Make the following amendments to said Section:

(I) Amend **Section 107.01 Insurance Requirements** from lines to 81 to read as follows:

"**(A) Obligation of Contractor.** Contractor shall not commence any work until it obtains, at its own expense, all required insurance described herein. Such insurance shall be provided by an insurance company authorized by the laws of the State to issue such insurance in the State of Hawaii. Coverage by a "Non-Admitted" carrier is permissible provided the carrier has a Best's Rating of "A-VII" or better. The Contractor shall maintain and ensure all insurance policies are current for the full period of the contract until final acceptance of the work by the State.

The Certificate of Insurance shall contain: a clause that it is agreed that any insurance maintained by the State of Hawaii will apply in excess of, and not contribute with, insurance provided by this policy; and shall be accompanied by endorsement form CG2010 or equivalent naming the State as an additional insured to the policy which status shall be maintained for the full period of the contract until final acceptance of the work by State.

The Contractor shall obtain all required insurance as part of the contract price. Where there is a requirement for the State of Hawaii and its officers and employees to be named as additional insureds under any Contractor's insurance policy, before the State of Hawaii issues the Notice to Proceed, the Contractor shall obtain and submit to the Engineer a Certificate of Insurance and a written policy endorsement that confirms the State of Hawaii and its officers and employees are additional insureds for the specific State project number and project title under such insurance policies. The written policy endorsement must be issued by the insurance company insuring the Contractor for the specified policy type or by an agent of such insurance company who is vested with the authority to issue a written policy endorsement. The insurer's agent shall also submit written confirmation of such authority to bind the insurer. Any delays in the issuance of the Notice to Proceed attributed to the failure to obtain the proof of the State of Hawaii and its officers and employees' additional insured status shall be charged to the Contractor.

A mere Certificate of Insurance issued by a broker who represents the Contractor (but not the Contractor's insurer), or by any other party who is not authorized to contractually name the State as an additional insured under the Contractor's insurance policy, is not sufficient to meet the Contractor's insurance obligations.

Certificates shall contain a provision that coverages being certified will not be cancelled or materially changed without giving the Engineer at least thirty (30) days prior written notice. Contractor will immediately provide written notice to the Director should any of the insurance policies evidenced on its Certificate of Insurance form be cancelled, reduced in scope or coverage, or not renewed upon expiration. Should any policy be canceled before final acceptance of the work by the State, and the Contractor fails to immediately procure replacement insurance as specified, the State, in addition to all other remedies it may have for such breach, reserves the right to procure such insurance and deduct the cost thereof from any money due or to become due to the Contractor.

Nothing contained in these insurance requirements is to be construed as limiting the extent of Contractor's responsibility for payment of damages resulting from its operations under this contract, including the Contractor's obligation to pay liquidated damages, nor shall it affect the Contractor's separate and independent duty to defend, indemnify and hold the State harmless pursuant to other provisions of this contract. In no instance will the State's exercise of an option to occupy and use completed portions of the work relieve the Contractor of its obligation to maintain the required insurance until the date of final acceptance of the work.

All insurance described herein shall be primary and cover the insured for all work to be performed under the contract, all work performed incidental thereto or directly or indirectly connected therewith, including but not limited to traffic detour work, barricades, warnings, diversions, lane closures, and other work performed outside the work area and all change order work.

The Contractor shall, from time to time, furnish the Engineer, when requested, satisfactory proof of coverage of each type of insurance required covering the work. Failure to comply with the Engineer's request may result in suspension of the work, and shall be sufficient grounds to withhold future payments due the Contractor and to terminate the contract for Contractor's default.

(B) Types of Insurance. Contractor shall purchase and maintain insurance described below which shall provide coverage against claims arising out of the Contractor's operations under the

contract, whether such operations be by the Contractor itself or by any subcontractor or by anyone directly or indirectly employed by any of them or by anyone for whose acts any of them may be liable.

(1) Workers' Compensation. The Contractor shall obtain worker's compensation insurance for all persons whom they employ in carrying out the work under this contract. This insurance shall be in strict conformity with the requirements of the most current and applicable State of Hawaii Worker's Compensation Insurance laws in effect on the date of the execution of this contract and as modified during the duration of the contract.

(2) Auto Liability. The Contractor shall obtain Auto Liability Insurance covering all owned, non-owned and hired autos with a Combined single Limit of not less than $1,000,000 per occurrence for bodily injury and property damage with the State of Hawaii named as additional insured.

(3) General Liability. The Contractor shall obtain General Liability insurance with a limit of not less than $2,000,000 per occurrence and in the Aggregates for each of the following:

(a) Products - Completed/Operations Aggregate,

(b) Personal & Advertising Injury, and

(c) Bodily Injury & Property Damage

The General Liability insurance shall include the State as an Additional Insured. The required limit of insurance may be provided by a single policy or with a combination of primary and excess policies. .

(4) Builders Risk For All Work. The Contractor shall take out a policy of builder's risk insurance for the full replacement value of the project work; from a company licensed or otherwise authorized to do business in the State of Hawaii; naming the State as an additional insured under each policy; and covering all work, labor, and materials furnished by such Contractor and all its subcontractors against loss by fire, windstorm, tsunamis, earthquakes, lightning, explosion, other perils covered by the standard Extended Coverage Endorsement, vandalism, and malicious mischief."

(II) Add **Section 107.18 Citizen and Residential Labor Force** after line 745 to read as follows:

"107.18 Citizen and Residential Labor Force.

(A) Citizen Labor. No person shall be employed as a laborer or mechanic unless such person is a citizen of the United States or eligible to become one; provided that persons without such qualifications may be employed with the approval of the Governor until persons who are citizens and are competent for such services are available for hire.

(B) Residential Labor Force. In accordance with Act 192; SLH 2011, no less than eighty (80) percent of the bidder's labor force working on the contract shall be provided by Hawaii residents. This act applies to all construction procurements under HRS Chapter 103D; however this act does not apply to procurements for professional services under Section 103D-304 and small purchases under Section 103D-305. This act is also applicable to any subcontract of $50.000.00 or more in connection with this contract.

Resident means a person who is physically present in the State of Hawaii at the time the person claims to have established the person's domicile in the State of Hawaii and shows the person's intent is to make Hawaii the person's primary residence.

(C) Percentage of workforce shall be determined by dividing the labor hours (including subcontractors) provided by residents working on the project divided by the total number of hours worked by all employees of the contractor in the performance of the contract. Hours worked by employees within shortage trades as determined by the Department of Labor and Industrial Relations shall not be included in the calculation of this percentage.

(D) Certification of compliance with the forgoing provisions shall be made by the contractor in the form of a written oath submitted to the Procurement Officer on a monthly basis for the duration of the contract.

(E) Sanctions for non compliance with these provisions are as follows:

(1) With respect to the General Contractor, withholding of payment on the contract until the Contractor or its Subcontractor complies with HRS Chapter 103B as amended by Act 192, SLH 2011.

(2) Proceedings for debarment or suspension of the Contractor or Subcontractor under Hawaii Revised Statutes § 103D-702.

This Section shall not apply when its application will disqualify the State from receiving federal funds or aid."

END OF SECTION 107

Amend **Section 108 – PROSECUTION AND PROGRESS** to read as follows:

"108 – PROSECUTION AND PROGRESS

108.01 Notice to Proceed (NTP). A Notice To Proceed will be issued to the Contractor not more 30 days after the contract certification date. The Engineer may suspend the contract before issuing the Notice To Proceed, in which case the Contractor's remedies are exclusively those set forth in Subsection 108.10 – Suspension of Work.

The Contractor shall be allowed up to 60 calendar days after the Notice to Proceed to begin physical work. The Start Work Date will be established when this period ends or on the actual day that physical work begins, whichever is first. Charging of Contract Time will begin on the Start Work Date. The Contractor shall notify the Engineer, in writing, at least five working days before beginning physical work.

In the event that the Contractor fails to start physical work within the time specified, the Engineer may terminate the contract in accordance with Subsection 108.11 – Termination of Contract for Cause.

During the period between the Notice to Proceed and the Start Work Date the Contractor should adjust work forces, equipment, schedules, and procure materials and required permits, prior to beginning physical work.

Any physical work done prior to the Start Work Date will be considered unauthorized work. If the Engineer does not direct that the unauthorized work be removed, it shall be paid for after the Start Work Date and only if it is acceptable.

In the event that the Engineer establishes, in writing, a Start Work Date that is beyond 60 calendar days from the Notice to Proceed date, the Contractor may submit a claim in accordance with, Subsection 107.15 – Disputes and Claims for increased labor and material costs which are directly attributable to the delay beyond the first 60 calendar days after the NTP date.

The Contractor shall notify the Engineer at least 24 hours before restarting physical work after a suspension of work pursuant to Subsection 108.10 – Suspension of Work.

Once physical work has begun, the Contractor shall work expeditiously and pursue the work diligently to completion with the contract time. If a portion of the work is to be done in stages, the Contractor shall leave the area safe and usable for the user agency and the public at the end of each stage.

108.02 Prosecution of Work. Unless otherwise permitted by the Engineer, in writing, the Contractor shall not commence with physical construction unless sufficient materials and equipment are available for either continuous construction or completion of a specified portion of the work.

108.03 Preconstruction Submittals. The awardee shall submit to the Engineer for information and review the pre-construction submittals within 30 calendar days from notice to proceed. Until the items listed below are received and found acceptable by the Engineer, the Contractor shall not start physical work unless otherwise authorized to do so in writing and subject to such conditions set by the Engineer. Charging of Contract Time will not be delayed, and additional contract time will not be granted due to Contractor delay in submitting acceptable preconstruction submittals. No progress payment will be made to the Contractor until the Engineer acknowledges, in writing, receipt of the following preconstruction submittals acceptable to the Engineer:

(1) List of the Superintendent and other Supervisory Personnel, and their contact information.

(2) Name of person(s) authorized to sign for the Contractor.

(3) Work Schedule including hours of operation.

(4) Initial Progress Schedule (See Subsection 108.06 – Progress Schedule).

(5) Water Pollution and Siltation Control Submittals, including Site-Specific Best Management Practice Plan.

(6) Solid Waste Disposal form.

(7) Tax Rates.

(8) Insurance Rates.

(9) Certificate of Insurance, satisfactory to the Engineer, indicating that the Contractor has in place all insurance coverage required by the contract documents.

(10) Schedule of agreed prices.

(11) List of suppliers.

(12) Traffic Control Plan, if applicable.

108.04 Character and Proficiency of Workers. The Contractor shall at all times provide adequate supervision and sufficient labor and equipment for prosecuting the work to full completion in the manner and within the time required by the contract. The superintendent and all other representatives of the Contractor shall act in a civil and honest manner in all dealings with the Engineer, all other State officials and representatives, and the public, in connection with the work.

All workers shall possess the proper license, certification, job classification, skill, training, and experience necessary to properly perform the work assigned to them.

The Engineer may direct the removal of any worker(s) who does not carry out the assigned work in a proper and skillful manner or who is disrespectful, intemperate, violent, or disorderly. The worker shall be removed forthwith by the Contractor and will not work again without the written permission of the Engineer.

108.05 Contract Time.

(A) Calculation of Contract Time. When the contract time is on a working day basis, the total contract time allowed for the performance of the work will be the number of working days shown in the contract plus any additional working days authorized in writing as provided hereinafter. The count of elapsed working days to be charged against contract time, will begin from the Start Work Date and will continue consecutively to the date of Substantial Completion. When multiple shifts are used to perform the work, the State will not consider the hours worked over the normal eight working hours per day or night as an additional working day.

When the contract is on a calendar day basis, the total contract time allowed for the performance of the work will be the number of days shown in the contract plus any additional days authorized in writing as provided hereinafter. The count of elapsed days to be charged against contract time will begin from the Start Work Date and will continue consecutively to the date of Substantial Completion. The Engineer will exclude days elapsing between the orders of the Engineer to suspend work and resume work for suspensions not the fault of the Contractor.

(B) Modifications of Contract Time. Whenever the Contractor believes that an extension of contract time is justified, the Contractor shall serve written notice on the Engineer not more than five working days after the occurrence of the event that causes a delay or justifies a contract time extension. Contract time may be adjusted for the following reasons or events, but only if and to the extent the critical path has been affected:

(1) Changes in the Work, Additional Work, and Delays Caused by the State. If the Contractor believes that an extension of time is justified on account of any act or omission by the State, and is not adequately provided for in a field order or change order, it must request the additional time as provided above. At the request of the Engineer, the Contractor must show how the critical path will be affected and must also support the time extension request with schedules, as well as statements from its subcontractors, suppliers, or manufacturers, as necessary.

Claims for compensation for any altered or additional work will be determined pursuant to Subsection 104.02 – Changes.

Additional time to perform the extra work will be added to the time allowed in the contract without regard to the date the change directive was issued, even if the contract completion date has passed. A change requiring time issued after contract time has expired will not constitute an excusal or waiver of pre-existing Contractor delay.

(2) Delay for Permits. For delays in the routine application and processing time required to obtain necessary permits, including permits to be obtained from State agencies, the Engineer may grant an extension provided that the permit takes longer than 30 days to acquire and the delay is not caused by the Contractor, and provided that as soon as the delay occurs, the Contractor notifies the Engineer in writing that the permits are not available. Permits required by the contract that take less than 30 days to acquire from the time which the appropriate documents are granted shall be acquired between Notice to Proceed and Start Work Date or accounted for in the contractor's progress schedule. Time extensions will be the exclusive relief granted on account of such delays.

(3) Delays Beyond Contractor's Control. For delays caused by acts of God, a public enemy, fire, inclement weather days or adverse conditions resulting therefrom, earthquakes, floods, epidemics, quarantine restrictions, labor disputes impacting the Contractor or the State, freight embargoes and other reasons beyond the Contractor's control, the Contractor may be granted an extension of time provided that:

(a) In the written notice of delay to the Engineer, the Contractor describes possible effects on the completion date of the contract. The description of delays shall:

1. State specifically the reason or reasons for the delay and fully explain in a detailed chronology how the delay affects the critical path.

2. Include copies of pertinent documentation to support the time extension request.

3. Cite the anticipated period of delay and the time extension requested.

4. State either that the above circumstances have been cleared and normal working conditions restored

as of a certain day or that the above circumstances will continue to prevent completion of the project.

(b) The Contractor shall notify the Engineer in writing when the delay ends. Time extensions will be the exclusive relief granted and no additional compensation will be paid the Contractor for such delays.

(4) Delays in Delivery of Materials or Equipment. For delays in delivery of materials or equipment, which occur as a result of unforeseeable causes beyond the control and without fault of the Contractor, its subcontractor(s) or supplier(s), time extensions shall be the exclusive relief granted and no additional compensation will be paid the Contractor on account of such delay. The delay shall not exceed the difference between the originally scheduled delivery date and the actual delivery date. The Contractor may be granted an extension of time provided that it complies with the following procedures:

(a) The Contractor's written notice to the Engineer must describe the delays and state the effect such delays may have on the critical path.

(b) The Contractor, if requested, must submit to the Engineer within five days after a firm delivery date for the material and equipment is established, a written statement regarding the delay. The Contractor must justify the delay as follows:

1. State specifically all reasons for the delay. Explain in a detailed chronology the effect of the delay on the critical path.

2. Submit copies of purchase order(s), factory invoice(s), bill(s) of lading, shipping manifest(s), delivery tag(s), and any other documents to support the time extension request.

3. Cite the start and end date of the delay and the time extension requested.

(5) Delays for Suspension of Work. When the performance of the work is totally suspended for one or more days (calendar or working days, as appropriate) by order of the Engineer in accordance with Subsections 108.10(A)(1), 108.10(A)(2), or 108.10(A)(5) the number of days from the effective date of the Engineer's order to suspend operations to the effective date of the Engineer's order to resume operations shall not be counted as

contract time and the contract completion date will be adjusted. During periods of partial suspensions of the work, the Contractor will be granted a time extension only if the partial suspension affects the critical path. If the Contractor believes that an extension of time is justified for a partial suspension of work, it must request the extension in writing at least five working days before the partial suspension will affect the critical operation(s) in progress. The Contractor must show how the critical path was increased based on the status of the work and must also support its claim if requested, with statements from its subcontractors. A suspension of work will not constitute a waiver of pre-existing Contractor delay.

(6) Contractor Caused Delays. No time extension will be granted under the following circumstances:

(a) Delays within the Contractor's control in performing the work caused by the Contractor, subcontractor, supplier, or any combination thereof.

(b) Delays within the Contractor's control in arrival of materials and equipment caused by the Contractor, subcontractor, supplier, or any combination thereof, in ordering, fabricating, and delivery.

(c) Delays requested for changes which do not affect the critical path.

(d) Delays caused by the failure of the Contractor to make submittals in a timely manner for review and acceptance by the Engineer, such as but not limited to shop drawings, descriptive sheets, material samples, and color samples except as covered in Subsection 108.05(B)(3) – Delays Beyond Contractor's Control and 108.05(B)(4) – Delays in Delivery of Materials or Equipment.

(e) Delays caused by the failure to submit sufficient information and data in a timely manner in the proper form in order to obtain necessary permits related to the work.

(f) Failure to follow the procedure within the time allowed by contract to request a time extension.

(g) Failure of the Contractor to provide evidence sufficient to support the time extension request.

(7) Reduction in Time. If the State deletes or modifies any portion of the work, an appropriate reduction of contract time may be made in accordance with Subsection 104.02 - Changes.

108.06 Progress Schedules.

(A) Forms of Schedule. All schedules shall be submitted using the specific computer program designated in the bid documents. If no such scheduling software program is designated, then all schedules shall be submitted using the latest version of Microsoft Project by Microsoft or approved equivalent software program.

Schedule submittals shall be as follows:

(1) For Contracts $2,000,000 or less or For Contract Time 100 Working Days or 140 Calendar Days or Less. For contracts of $2,000,000 or less or for contract time of 100 working days or 140 calendar days or less, the progress schedule will be a Time Scaled Logic Diagram (TSLD). The Contractor shall submit a TSLD submittal package meeting the following requirements and having these essential and distinctive elements:

(a) The major features of work, such as but not limited to BMP installation, grubbing, roadway excavation, structure excavation, structure construction, shown in the chronological order in which the Contractor proposes to work that feature or work and its location on the project. The schedule shall account for normal inclement weather, unusual soil or other conditions that may influence the progress of the work, schedules, and coordination required by any utility, off or on site fabrications, and other pertinent factors that relate to progress;

(b) All features listed or not listed in the contract documents that the Contractor considers a controlling factor for the timely completion of the contract work.

(c) The time span and sequence of the activities or events for each feature, and its interrelationship and interdependencies in time and logic to other features in order to complete the project.

(d) The total anticipated time necessary to complete work required by the contract.

(e) A chronological listing of critical intermediate dates or time periods for features or milestones or phases that can affect timely completion of the project.

(f) Major activities related to the location on the project.

(g) Non-construction activities, such as submittal and acceptance periods for shop drawings and material, procurement, testing, fabrication, mobilization, and demobilization or order dates of long lead material.

(h) Set schedule logic for out of sequence activities to retain logic. In addition, open ends shall be non-critical.

(i) Show target bars for all activities.

(j) Vertical and horizontal sight lines both major and minor shall be used as well as a separator line between groups. The Engineer will determine frequency and style.

(k) The file name, print date, revision number, data and project title and number shall be included in the title block.

(l) Have columns with the appropriate data in them for activity ID, description, original duration, remaining duration, early start, early finish, total float, percent complete, resources. The resource column shall list who is responsible for the work to be done in the activity. These columns shall be to the left of the bar chart.

(2) For Contracts Which Have A Contract Amount More Than $2,000,000 Or Having A Contract Time Of More Than 100 Working Days Or 140 Calendar Days. For contracts which have a contract amount more than $2,000,000 or contract time of more than 100 working days or 140 calendar days, the Contractor shall submit a Timed-Scaled Logic Diagram (TSLD) meeting the following requirements and having these essential and distinctive elements:

(a) The information and requirements listed in Subsection 108.06(A)(1) – For Contracts $2,000,000 or Less or For Contract Time 100 Working Days or 140 Calendar Days or Less.

(b) Additional reports and graphics available from the software as requested by the Engineer.

(c) Sufficient detail to allow at least weekly monitoring of the Contractor and subcontractor's operations.

(d) The time scaled schematic shall be on a calendar or working days basis. What will be used shall be determined by how the contract keeps track of time. It will be the same. Plot the critical calendar dates anticipated.

(e) Breakdown of activity, such as forming, placing reinforcing steel, concrete pouring and curing, and stripping in concrete construction. Indicate location of work to be done in such detail that it would be easily determined where work would be occurring within approximately 200 feet.

(f) Latest start and finish dates for critical path activities.

(g) Identify responsible subcontractor, supplier, and others for their respective activity.

(h) No individual activity shall have duration of more than 20 calendar days unless requested and approved by the Engineer.

(i) All activities shall have work breakdown structure codes and activity codes. The activity codes shall have coding that incorporates information for phase, location, who is responsible for doing work and type of operation and activity description.

j) Incorporate all physical access and availability restraints.

(B) Inspection and Testing. All schedules shall provide reasonable time and opportunity for the Engineer to inspect and test each work activity.

(C) Engineer's Acceptance of Progress Schedule. The submittal of, and the Engineer's receipt of any progress schedule, shall not be deemed an agreement to modify any terms or conditions of the contract. Any modifications to the contract terms and conditions that appear in or may be inferred from an acceptable schedule will not be valid or enforceable unless and until the Engineer exercises discretion to issue an appropriate change order. Nor shall any submittal or receipt imply the Engineer's approval of the schedule's breakdown, its individual elements, any critical path that may be shown, nor shall it obligate the State to make its personnel available outside normal working hours or the working hours established by the Contract in order to accommodate such schedule. The Contractor has the risk of all elements (whether or not shown) of the schedule and its execution. No claim for additional compensation, time, or both, shall be made by the Contractor or recognized by the Engineer for delays during any period for which an acceptable progress schedule or

an updated progress schedule as required by Subsection 108.06(E) – Contractor's Continuing Schedule Submittal Requirements had not been submitted. Any acceptance or approval of the schedule shall be for general format only and shall not be deemed an agreement by the State that the construction means, methods, and resources shown on the schedule will result in work that conforms to the contract requirements or that the sequences or durations indicated are feasible.

(D) Initial Progress Schedule. The Contractor shall submit an initial progress schedule. The initial progress schedule shall consist of the following:

(1) Four sets of the TSLD schedule.

(2) All the software files and data to re-create the TSLD in a computerized software format as specified by the Engineer.

(3) A listing of equipment that is anticipated to be used on the project. Including the type, size, make, year of manufacture, and all information necessary to identify the equipment in the Rental Rate Blue Book for Construction Equipment.

(4) An anticipated manpower requirement graph plotting contract time and total manpower requirement. This may be superimposed over the payment graph.

(5) A Method Statement that is a detailed narrative describing the work to be done and the method by which the work shall be accomplished for each major activity. A major activity is an activity that:

(a) Has a duration longer than five days.

(b) Is a milestone activity.

(c) Is a contract item that exceeds $10,000 on the contract cost proposal.

(d) Is a critical path activity.

(e) Is an activity designated as such by the Engineer.

Each Method Statement shall include the following items needed to fulfill the schedule:

(a) Quantity, type, make, and model of equipment.

(b) The manpower to do the work, specifying worker classification.

(c) The production rate per eight hour day, or the working hours established by the contract documents needed to meet the time indicated on the schedule. If the production rate is not for eight hours, the number of working hours shall be indicated.

(6) Two sets of color time-scaled project evaluation and review technique charts ("PERT") using the activity box template of Logic – Early Start or such other template designated by the Engineer.

If the contract documents establish a sequence or order for the work, the initial progress schedule shall conform to such sequence or order.

(E) Contractor's Continuing Schedule Submittal Requirements. After the acceptance of the initial TSLD and when construction starts, the Contractor shall submit four plotted progress schedules, two PERT charts, and reports on all construction activities every two weeks (bi-weekly). This scheduled bi-weekly submittal shall also include an updated version of the project schedule in a computerized software format as specified by the Engineer. The submittal shall have all the information needed to re-create that time period's TSLD plot and reports. The bi-weekly submittal shall include, but not limited to, an update of activities based on actual durations, all new activities and any changes in duration or start or finish dates of any activity.

The Contractor shall submit with every update, in report form acceptable to the Engineer, a list of changes to the progress schedule since the previous schedule submittal. The Engineer may change the frequency of the submittal requirements but may not require a submittal of the schedule to be more than once a week. The Engineer may decrease the frequency of the submittal of the bi-weekly schedule.

The Contractor shall submit updates of the anticipated work completion graph, equipment listing, manpower requirement graph or method statement when requested by the Engineer. The Contractor shall submit such updates within 4 calendar days from the date of the request by the Engineer.

The Engineer may withhold progress payment until the Contractor is in compliance with all schedule update requirements

(F) Float. All float appearing on a schedule is a shared commodity. Float does not belong to or exist for the exclusive use or benefit of either the State or the Contractor. The State or the Contractor has the

opportunity to use available float until it is depleted. Float has no monetary value.

(G) Scheduled Meetings. The Contractor shall meet on a bi-weekly basis with the Engineer to review the progress schedule. The Contractor shall have someone attending the meeting that can answer all questions on the TSLD and other schedule related submittals.

(H) Accelerated Schedule; Early Completion. If the Contractor submits an accelerated schedule (shorter than the contract time), the Engineer's review and acceptance of an accelerated schedule does not constitute an agreement or obligation by the State to modify the contract time or completion date. The Contractor is solely responsible for and shall accept all risks and any delays, other than those that can be directly and solely attributable to the State, that may occur during the work, until the contract completion date. The contract time or completion date is established for the benefit of the State and cannot be changed without an appropriate change order or Substantial Completion granted by the State. The State may accept the work before the completion date is established, but is not obligated to do so.

If the TSLD indicates an early completion of the project, the Contractor shall, upon submittal of the schedule, cooperate with the Engineer in explaining how it will be achieved. In addition, the Contractor shall submit the above explanation in writing which shall include the State's part, if any, in achieving the early completion date. Early completion of the project shall not rely on changes to the Contract Documents unless approved by the Engineer.

(I) Contractor Responsibilities. The Contractor shall promptly respond to any inquiries from the Engineer regarding any schedule submission. The Contractor shall adjust the schedule to address directives from the Engineer and shall resubmit the TSLD package to the Engineer until the Engineer finds it acceptable.

The Contractor shall perform the work in accordance with the submitted TSLD. The Engineer may require the Contractor to provide additional work forces and equipment to bring the progress of the work into conformance with the TSLD at no increase in contract price or contract time whenever the Engineer determines that the progress of the work does not insure completion within the specified contract time.

108.07 Weekly Meeting. In addition to the bi-weekly schedule meetings, the Contractor shall be available to meet once a week with the Engineer at the time and place as determined by the Engineer to discuss the work and its progress including but not limited to, the progress of the project, potential problems, coordination of work, submittals, erosion control reports, etc. The

Contractor's personnel attending shall have the authority to make decisions and answer questions.

The Contractor shall bring to weekly meetings a detailed work schedule showing the next three weeks' work. Number of copies of the detailed work schedule to be submitted will be determined by the Engineer. Submit directly to Material Testing and Research Branch (MTRB) one copy of each three-week schedule on the same day as the work schedule is submitted to the Engineer. The three-week schedule is in addition to the TSLD and shall in no way be considered as a substitute for the TSLD or vice versa. The three-week schedule shall show:

(a) All construction events, traffic control and BMP related activities in such detail that the Engineer will be able to determine at what location and type of work will be done for any day for the next three weeks. This is for the State to use to plan its manpower requirements for that time period.

(b) The duration of all events and delays.

(c) The critical path clearly marked in red or marked in a manner that makes it clearly distinguishable from other paths and is acceptable to the Engineer.

(d) Critical submittals and requests for information (RFI's).

(e) The project title, project number, date created, period the schedule covers, Contractor's name and creator of the schedule on each page.

Two days prior to each weekly meeting, the Contractor shall submit a list of outstanding submittals, RFIs and issues that require discussion. Submit an additional copy of these lists to MTRB directly at the same time as the submittal to the Engineer.

108.08 Liquidated Damages for Failure to Complete the Work or Portions of the Work on Time. The actual amount of damages resulting from the Contractor's failure to complete the contract in a timely manner is difficult to accurately determine. Therefore the amount of such damages shall be liquidated damages as set forth herein and in the special provisions. The State may, at its discretion, deduct the amount from monies due or that may become due under the contract.

When the Contractor fails to reach substantial completion of the work for which liquidated damages are specified, within the time or times fixed in the contract or any extension thereof, in addition to all other remedies for breach that may be available to the State, the Contractor shall pay liquidated damages to the State, in the amount of $5,000 per working day.

(A) Liquidated Damages Upon Termination. If the State terminates on account of Contractor's default, liquidated damages may be charged against the defaulting Contractor and its surety until final completion of work.

(B) Liquidated Damages for Failure to Complete the Punchlist. The Contractor shall complete the work on any punchlist created after the pre-final inspection, within the contract time or any extension thereof.

When the Contractor fails to complete the work on such punchlist within the contract time or any extension thereof, the Contractor shall pay liquidated damages to the State of 20 percent of the amount of liquidated damages established for failure to substantially complete the work within contract time. Liquidated damages shall not be assessed for the period between:

(1) Notice from the Contractor that the project is substantially complete and the time the punchlist is delivered to the Contractor.

(2) The date of the completion of punchlist as determined by the Engineer and the date of the successful final inspection, and

(3) The date of the Final Inspection that results in Substantial Completion and the receipt by the Contractor of the written notice of Substantial Completion.

(C) Actual Damages Recoverable If Liquidated Damages Deemed Unenforceable. In the event a court of competent jurisdiction holds that any liquidated damages assessed pursuant to this contract are unenforceable, the State will be entitled to recover its actual damages for Contractor's failure to complete the work, or any designated portion of the work within the time set by the contract.

108.09 Rental Fees for Unauthorized Lane Closure or Occupancy. In addition to all other remedies available to the State for Contractor's breach of the terms of the contract, the Engineer will assess the rental fees in the amount of $2,500 for every one-to fifteen-minute increment or portion thereof, for each location, for each roadway lane closed to public use or is encroached upon or occupied beyond the time periods authorized in the contract or by the Engineer. The State may, at its discretion, deduct the amount from monies due or that may become due under the contract. The rental fee may be waived in whole or part if the Engineer determines that the unauthorized period of lane closure or occupancy was due to factors beyond the control of the Contractor. Equipment breakdown is not a cause to waive lane rental to be assessed.

108.10 Suspension of Work.

(A) Suspension of Work. The Engineer may, by written order, suspend the performance of the work, either in whole or in part, for such periods as the Engineer may deem necessary, for any cause, including but not limited to:

(1) Weather or soil conditions considered unsuitable for prosecution of the work.

(2) Whenever a redesign that may affect the work is deemed necessary by the Engineer.

(3) Unacceptable noise or dust arising from the construction even if it does not violate any law or regulation.

(4) Failure on the part of the Contractor to:

(a) Correct conditions unsafe for the general public or for the workers.

(b) Carry out orders given by the Engineer.

(c) Perform the work in strict compliance with the provisions of the contract.

(d) Provide adequate supervision on the jobsite.

(5) The convenience of the State.

(B) Partial and Total Suspension. Suspension of work on some but not all items of work shall be considered a "partial suspension". Suspension of work on all items shall be considered "total suspension". The period of suspension shall be computed from the date set out in the written order for work to cease until the date of the order for work to resume.

(C) Reimbursement to Contractor. In the event that the Contractor is ordered by the Engineer in writing as provided herein to suspend all work under the contract for the reasons specified in Subsections 108.10(A)(2), 108.10(A)(3), or 108.10(A)(5) of the "Suspension of Work" paragraph, the Contractor may be reimbursed for actual direct costs incurred on work at the jobsite, as authorized in writing by the Engineer, including costs expended for the protection of the work. An allowance of 5 percent for indirect categories of delay costs will be paid on any reimbursed direct costs, including extended branch and home-office overhead and delay impact costs. No allowance will be made for anticipated profits. Payment for equipment which is ordered to standby

during such suspension of work shall be made as described in Subsection 109.06(H) - Idle and Standby Equipment.

(D) Cost Adjustment. If the performance of all or part of the work is suspended for reasons beyond the control of the Contractor except an adjustment shall be made for any increase in cost of performance of this contract (excluding profit) necessarily caused by such suspension, and the contract modified in writing accordingly.

However, no adjustment to the contract price shall be made for any suspension, delay, or interruption:

(1) For weather related conditions.

(2) To the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor.

(3) Or, for which an adjustment is provided for or excluded under any other provision of this Contract.

(E) Claims for Adjustment. Any adjustment in contract price made shall be determined in accordance with Subsections 104.02 – Changes and 104.06 – Methods of Price Adjustment.

Any claims for such compensation shall be filed in writing with the Engineer within 30 days after the date of the order to resume work or the claim will not be considered. The claim shall conform to the requirements of Subsection 107.15(D) – Making of a Claim. The Engineer will take the claim under consideration, may make such investigations as are deemed necessary and will be the sole judge as to the equitability of the claim. The Engineer's decision will be final.

(F) No Adjustment. No provision of this clause shall entitle the Contractor to any adjustments for delays due to failure of its surety, the cancellation or expiration of any insurance coverage required by the contract documents, for suspensions made at the request of the Contractor, for any delay required under the contract, for suspensions, either partial or whole, made by the Engineer under Subsection 108.10(A)(4) of the "Suspension of work" paragraph.

108.11 Termination of Contract for Cause.

(A) Default. If the Contractor refuses or fails to perform the work, or any separable part thereof, with such diligence as will assure its completion within the time specified in this contract, or any extension thereof, or commits any other material breach of this contract, and further fails within seven days after receipt of written notice from the Engineer to

commence and continue correction of the refusal or failure with diligence and promptness, the Engineer may, by written notice to the Contractor, declare the Contractor in breach and terminate the Contractor's right to proceed with the work or the part of the work as to which there has been delay or other breach of contract. In such event, the State may take over the work, perform the same to completion, by contract or otherwise, and may take possession of, and utilize in completing the work, the materials, appliances, and plants as may be on the site of the work and necessary therefore. Whether or not the Contractor's right to proceed with the work is terminated, the Contractor and the Contractor's sureties shall be liable for any damage to the State resulting from the Contractor's refusal or failure to complete the work within the specified time.

(B) Additional Rights and Remedies. The rights and remedies of the State provided in this contract are in addition to any other rights and remedies provided by law.

(C) Costs and Charges. All costs and charges incurred by the State, together with the cost of completing the work under contract, will be deducted from any monies due or which would or might have become due to the Contractor had it been allowed to complete the work under the contract. If such expense exceeds the sum which would have been payable under the contract, then the Contractor and the surety shall be liable and shall pay the State the amount of the excess.

In case of termination, the Engineer will limit any payment to the Contractor to the part of the contract satisfactorily completed at the time of termination. Payment will not be made until the work has satisfactorily been completed and all required documents, including the tax clearance required by Subsection 109.11 – Final Payment are submitted by the Contractor. Termination shall not relieve the Contractor or Surety from liability for liquidated damages.

(D) Erroneous Termination for Cause. If, after notice of termination of the Contractor's right to proceed under this section, it is determined for any reason that good cause did not exist to allow the State to terminate as provided herein, the rights and obligations of the parties shall be the same as, and the relief afforded the Contractor shall be limited to, the provisions contained in Subsection 108.12 – Termination for Convenience.

108.12 Termination For Convenience.

(A) Terminations. The Director may, when the interests of the State so require, terminate this contract in whole or in part, for the convenience of the State. The Director will give written notice of the termination to the Contractor specifying the part of the contract terminated and when termination becomes effective.

(B) Contractor's Obligations. The Contractor shall incur no further obligations in connection with the terminated work and on the date set in the notice of termination the Contractor shall stop work to the extent specified. The Contractor shall also terminate outstanding orders and subcontracts as they relate to the terminated work. The Contractor shall settle the liabilities and claims arising out of the termination of subcontracts and orders connected with the terminated work subject to the State's approval. The Engineer may direct the Contractor to assign the Contractor's right, title, and interest under terminated orders or subcontracts to the State. The Contractor must still complete the work not terminated by the notice of termination and may incur obligations as necessary to do so.

(C) Right to Construction and Goods. The Engineer may require the Contractor to transfer title and to deliver to the State in the manner and to the extent directed by the Engineer, the following:

(1) Any completed work.

(2) Any partially completed construction, goods, materials, parts, tools, dies, jigs, fixtures, drawings, information, and contract rights (hereinafter called "construction material") that the Contractor has specifically produced or specially acquired for the performance of the terminated part of this contract.

(3) The Contractor shall protect and preserve all property in the possession of the Contractor in which the State has an interest. If the Engineer does not elect to retain any such property, the Contractor shall use its best efforts to sell such property and construction materials for the State's account in accordance with the standards of HRS Chapter 490:2-706.

(D) Compensation.

(1) The Contractor shall submit a termination claim specifying the amounts due because of the termination for convenience together with cost or pricing data, submitted to the extent required by HAR Subchapter 15, Chapter 3-122. If the Contractor fails to file a termination claim within one year from the effective date of termination, the Engineer may pay the Contractor, if at all, an amount set in accordance with Subsection 108.12(D)(3).

(2) The Engineer and the Contractor may agree to a settlement provided the Contractor has filed a termination claim supported by cost or pricing data submitted as required and that the settlement does not exceed the total contract price plus settlement costs reduced by payments previously made by the State, the proceeds

of any sales of construction, supplies, and construction materials under Subsection 108.12(C)(3), and the proportionate contract price of the work not terminated.

(3) Absent complete agreement, the Engineer will pay the Contractor the following amounts less any payments previously made under the contract:

(a) The cost of all contract work performed prior to the effective date of the notice of termination work plus a 5 percent markup on the actual direct costs, including amounts paid to subcontractor, less amounts paid or to be paid for completed portions of such work; provided, however, that if it appears that the Contractor would have sustained a loss if the entire contract would have been completed, no markup shall be allowed or included and the amount of compensation shall be reduced to reflect the anticipated rate of loss. No anticipated profit or consequential damage will be due or paid.

(b) Subcontractors shall be paid a markup of 10 percent on their direct job costs incurred to the date of termination. No anticipated profit or consequential damage will be due or paid to any subcontractor. These costs must not include payments made to the Contractor for subcontract work during the contract period.

(c) The total sum to be paid the Contractor shall not exceed the total contract price reduced by the amount of any sales of construction supplies, and construction materials.

(4) Cost claimed, agreed to, or established by the State shall be in accordance with HAR Chapter 3-123.

108.13 Pre-Final and Final Inspections.

(A) Inspection Requirements. Before the Engineer undertakes a final inspection of any work, a pre-final inspection must first be conducted. The Contractor shall notify the Engineer that the work has reached substantial completion and is ready for pre-final inspection.

(B) Pre-Final Inspection. Before notifying the Engineer that the work has reached substantial completion, the Contractor shall inspect the project and test all installed items with all of its subcontractors as appropriate. The Contractor shall also submit the following documents as applicable to the work:

(1) All written guarantees required by the contract.

(2) Two accepted final field-posted drawings as specified in Section 648 – Field-Posted Drawings;

(3) Complete weekly certified payroll records for the Contractor and Subcontractors.

(4) Certificate of Plumbing and Electrical Inspection.

(5) Certificate of building occupancy as required.

(6) Certificate of Soil and Wood Treatments.

(7) Certificate of Water System Chlorination.

(8) Certificate of Elevator Inspection, Boiler and Pressure Pipe Inspection.

(9) Maintenance Service Contract and two copies of a list of all equipment installed.

(10) Current Tax clearance. The contractor will be required to submit an additional tax clearance certificate when the final payment is made.

(11) All required material submittals, e.g., samples, test results, certifications, catalog cuts. No pre-final inspection will be held until all required material submittals have been submitted, reviewed and accepted by the Engineer and MTRB.

(12) And any other final items and submittals required by the contract documents.

(C) Procedure. When in compliance with the above requirements, the Contractor shall notify the Engineer in writing that the project has reached substantial completion and is ready for pre-final inspection.

The Engineer will then make a preliminary determination as to whether or not the project is substantially complete and ready for pre-final inspection. The Engineer may, in writing, postpone until after the pre-final inspection the Contractor's submittal of any of the items listed in Subsection 108.13(B) – Pre-Final Inspection, herein, if in the Engineer's discretion it is in the interest of the State to do so. The submittal of all required material submittals and their acceptance will not be waived and shall be complete before a request for a pre-final inspection is tendered.

If, in the opinion of the Engineer, the project is not substantially complete, the Engineer will provide the Contractor a punchlist of specific

deficiencies in writing which must be corrected or finished before the work will be ready for a pre-final inspection. The Engineer may add to or otherwise modify this punchlist from time to time. The Contractor shall take immediate action to correct the deficiencies and must repeat all steps described above including written notification that the work is ready for pre-final inspection.

After the Engineer is satisfied that the project appears substantially complete a pre-final inspection shall be scheduled within ten working days after receipt of the Contractor's latest letter of notification that the project is ready for pre-final inspection.

If, as a result of the pre-final inspection, the Engineer determines the work is not substantially complete, the Engineer will inform the Contractor in writing as to specific deficiencies which must be corrected before the work will be ready for another pre-final inspection. If the Engineer finds the work is substantially complete but finds deficiencies that shall be corrected before the work is ready for final inspection, the Engineer will prepare in writing and deliver to the Contractor a punchlist describing such deficiencies.

At any time before final acceptance, the Engineer may revoke the determination of substantial completion if the Engineer finds that it was not warranted and will notify the Contractor in writing the reasons therefore together with a description of the deficiencies negating the declaration.

When the date of substantial completion has been determined by the State, liquidated damages for the failure to complete the punchlist, if due to the State will be assessed in pursuant to Subsection 108.08(B) - Liquidated Damages for Failure to Complete the Punchlist.

(D) Punchlist; Clean Up and Final Inspection. Upon receiving a punchlist after pre-final inspection, the Contractor shall promptly devote all required time, labor, equipment, materials and incidentals to correct and remedy all punchlist deficiencies. The Engineer may add to or otherwise modify this punchlist until substantial completion of the project.

Before final inspection of the work, the Contractor shall clean all ground occupied by the Contractor in connection with the work of all rubbish, excess materials, temporary structures and equipment, shall remove all graffiti and defacement of the work and all parts of the work and the worksite shall be left in a neat and presentable condition to the satisfaction of the Engineer.

Final inspection will occur within ten working days after the Contractor notifies the Engineer in writing that all punchlist deficiencies remaining after the pre-final inspection have been completed and the Engineer concurs. If the Engineer determines that deficiencies still

remain at the final inspection, the work will not be accepted and the Engineer will notify the Contractor, in writing, of the deficiencies which shall be corrected and the steps above repeated.

If the Contractor fails to correct the deficiencies and complete the work by the established or agreed date, the State may correct the deficiencies by whatever method it deems appropriate and deduct the cost from any payments due the Contractor.

108.14 Substantial Completion and Final Acceptance.

(A) Substantial Completion. When the Engineer finds that the Contractor has satisfactorily completed all work for the project in compliance with the contract, with the exception of the planting period and the plant establishment period, the Engineer will notify the Contractor, in writing, of the project's substantial completion, effective as of the date of the final inspection. The substantial completion date shall determine end of contract time and relieve contractor of any additional accumulation of liquidated damages for failure to complete the punchlist.

(B) Final Acceptance. When the Engineer finds that the Contractor has satisfactorily completed all contract work in compliance with the contract including all plant establishment requirements, and all the materials have been accepted by the State, the Engineer will issue a Final Acceptance Letter. The Final Acceptance date shall determine the commencement of all guaranty periods subject to Subsection 108.16 – Contractor's Responsibility for Work; Risk of Loss or Damage.

108.15 Use of Structure or Improvement. The State has the right to use the structure, equipment, improvement, or any part thereof, at any time after it is considered by the Engineer as available. In the event that the structure, equipment or any part thereof is used by the State before final acceptance, the Contractor is not relieved of its responsibility to protect and preserve all the work until final acceptance.

108.16 Contractor's Responsibility for Work; Risk of Loss or Damage. Until the written notice of final acceptance has been received, the Contractor shall take every precaution against loss or damage to any part of the work by the action of the elements or from any other cause whatsoever, whether arising from the performance or from the non-performance of the work. The Contractor shall rebuild, repair, restore and make good all loss or damage to any portion of the work resulting from any cause before its receipt of the written notice of final acceptance and shall bear the risk and expense thereof.

The risk of loss or damage to the work from any hazard or occurrence that may or may not be covered by a builder's risk policy is that of the Contractor and Surety, unless such risk of loss is placed elsewhere by express language in the contract documents.

108.17 Guarantee of Work.

(1) Regardless of, and in addition to, any manufacturers' warranties, all work and equipment shall be guaranteed by the Contractor against defects in materials, equipment or workmanship for one year from the date of final acceptance or as otherwise specified in the contract documents.

(2) When the Engineer determines that repairs or replacements of any guaranteed work and equipment is necessary due to materials, equipment, or workmanship which are inferior, defective, or not in accordance with the terms of the contract, the Contractor shall, at no increase in contract price or contract time, and within five working days of receipt of written notice from the State, commence to all of the following:

(a) Correct all noted defects and make replacements, as directed by the Engineer, in the equipment and work.

(b) Repair or replace to new or pre-existing condition any damages resulting from such defective materials, equipment or installation thereof.

(3) The State will be entitled to the benefit of all manufacturers and installers warranties that extend beyond the terms of the Contractor's guaranty regardless of whether or not such extended warranty is required by the contract documents. The Contractor shall prepare and submit all documents required by the providers of such warranties to make them effective, and submit copies of such documents to the Engineer. If an available extended warranty cannot be transferred or assigned to the State as the ultimate user, the Contractor shall notify the Engineer who may direct that the warranted items be acquired in the name of the State as purchaser.

(4) If a defect is discovered during a guarantee period, all repairs and corrections to the defective items when corrected shall be guaranteed for a new duration equal to the original full guarantee period. The running of the guarantee period shall be suspended for all other work affected by any defect. The guarantee period for all other work affected by any such defect shall restart for its remaining duration upon confirmation by the Engineer that the deficiencies have been repaired or remedied.

(5) Nothing in this section is intended to limit or affect the State's rights and remedies arising from the discovery of latent defects in the work after the expiration of any guarantee period.

108.18 No Waiver of Legal Rights. The following will not operate or be considered as a waiver of any portion of the contract, or any power herein reserved, or any right to damages provided herein or by law:

(1) Any payment for, or acceptance of, the whole or any part of the work.

(2) Any extension of time.

(3) Any possession taken by the Engineer.

A waiver of any notice requirement or of any noncompliance with the contract will not be held to be a waiver of any other notice requirement or any other noncompliance with the contract.

108.19 Final Settlement of Contract.

(A) Closing Requirements. The contract will be considered settled after the project acceptance date and when the following items have been satisfactorily submitted, where applicable:

(1) All written guarantees required by the contract.

(2) Complete and certified weekly payrolls for the Contractor and its subcontractor's.

(3) Certificate of plumbing and electrical inspection.

(4) Certificate of building occupancy.

(5) Certificate for soil treatment and wood treatment.

(6) Certificate of water system chlorination.

(7) Certificate of elevator inspection, boiler and pressure pipe installation.

(8) Tax clearance.

(9) All other documents required by the Contract or by law.

(B) Failure to Meet Closing Requirements. The Contractor shall meet the applicable closing requirements within 60 days from the date of Project Acceptance or the agreed to Punchlist complete date. Should the Contractor fail to comply with these requirements, the Engineer may terminate the contract for cause."

END OF SECTION 108

SECTION 109 - MEASUREMENT AND PAYMENT

Make the following amendment to said Section:

(I) Amend **Subsection 109.05 Allowances for Overhead and Profit** by revising lines 101 to 110 to read as follows:

"**(1)** 20 percent of the direct cost for any work performed by the Contractor's own labor force.

(2) 20 percent of the direct cost for any work performed by each subcontractor's own labor force.

(3) For the Contractor or any subcontractor for work performed by their respective subcontractor or tier subcontractor, 10 percent of the amount due to the performing subcontractor or tier subcontractor."

(II) Amend **109.08(A) Monthly Payment** by adding the following after line 411:

"**(1) Retainage.** If the Engineer finds that the Contractor is progressing satisfactorily in completing the project work and:

a. Less than 50% of the whole contract cost is complete, the Engineer shall retain 5% of the value of the work done until the Engineer makes final payment;

b. More than 50% of the whole contract cost is complete, the Engineer may make the remaining progress payments in full.

c. After satisfactory completion of work other than landscaping items, the Engineer may adjust the amount of retainage to 15% of the landscaping items or 2½% of the total contract amount whichever is less. Do not use this subsection if the contract is only landscaping."

(III) Amend **Subsection 109.08(B) Payment for Material On Hand** by revising lines 421 to 423 to read as follows:

"**(2)** The materials shall be stored and handled in accordance with Subsection 105.14 – Storage and Handling of Materials and Equipment."

(IV) Amend **Subsection 109.11 Final Payment** by revising lines 568 to 580 to read as follows:

"**(3)** A current "Certificate of Vendor Compliance" issued by the Hawaii Compliance Express (HCE). The Certificate of Vendor Compliance is used to certify the Contractor's compliance with

(a) Section 103D-328, HRS (for all contracts $25,000 or more) which requires a current tax clearance certificate issued by the Hawaii State Department of Taxation and the Internal Revenue Service;

(b) Chapters 383, 386, 392, and 393, HRS; and

(c) Subsection 103D-310(c), HRS. The State reserves the right to verify that compliance is current prior to the issuance of final payment. Contractors are advised that non-compliance status will result in final payment being withheld until compliance is attained.

Sums necessary to meet the claims of any governmental agencies may be withheld from the sums due the Contractor until said claims have been fully and completely discharged or otherwise satisfied."

END OF SECTION 109

SECTION 201 – CLEARING AND GRUBBING

Make the following amendments to said Section:

(I) Amend **201.04 – Measurement** by revising lines 167 to 168 to read as follows:

"**201.04 Measurement.** The Engineer will measure clearing and grubbing per square yard in accordance with the contract documents."

(II) Amend **201.05 – Payment** by revising lines 170 to 179 to read as follows:

"**201.05 Payment.** The Engineer will pay for the accepted clearing and grubbing per square yard. Payment will be full compensation for the work prescribed in this section and the contract documents.

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

Pay Item	**Pay Unit**
Clearing and Grubbing	Square Yard"

END OF SECTION 201

Amend **Section 209 - TEMPORARY WATER POLLUTION, DUST, AND EROSION CONTROL** to read as follows:

"SECTION 209 - TEMPORARY WATER POLLUTION, DUST, AND EROSION CONTROL

209.01 Description. This section describes the following:

(A) Including detailed plans, diagrams, and written Site-Specific Best Management Practices (BMP); constructing, maintaining, and repairing temporary water pollution, dust, and erosion control measures at the project site, including local material sources, work areas and haul roads; removing and disposing hazardous wastes; control of fugitive dust (defined as uncontrolled emission of solid airborne particulate matter from any source other than combustion); and complying with applicable State and Federal permit conditions.

(B) Work associated with construction stormwater, dewatering, and hydrotesting activities and complying with conditions of the National Pollutant Discharge Elimination System (NPDES) permit(s) authorizing discharges associated with construction stormwater, dewatering, and hydrotesting activities.

(C) Potential pollutant identification and mitigation measures are listed in Appendix A for use in the development of the Contractor's Site-Specific BMP.

Requirements of this section also apply to construction support activities including concrete or asphalt batch plants, rock crushing plants, equipment staging yards/areas, material storage areas, excavated material disposal areas, and borrow areas located outside the State Right-of-Way. For areas serving multiple construction projects, or operating beyond the completion of the construction project in which it supports, the Contractor shall be responsible for securing the necessary permits, clearances, and documents, and following the conditions of the permits and clearances, at no cost to the State.

209.02 Materials. Comply with applicable materials described in Chapters 2 and 3 of the current HDOT "Construction Best Management Practices Field Manual". In addition, the materials shall comply with the following:

(A) Grass. Grass shall be a quick growing species such as rye grass, Italian rye grass, or cereal grasses. Grass shall be suitable to the area and provide a temporary cover that will not compete later with permanent cover. Alternative grasses are allowable if acceptable to the Engineer.

(B) Fertilizer and Soil Conditioners. Fertilizer and soil conditioners shall be a standard commercial grade acceptable to the Engineer. Fertilizer shall conform to Subsection 619.02(H)(1) - Commercial Fertilizer.

(C) Hydro-mulching. Hydro-mulching used as a temporary vegetative stabilization measure shall consist of materials in Subsections 209.02(A) - Grass, and 209.02(B) – Fertilizer and Soil Conditioners. Mulches shall be recycled materials including bagasse, hay, straw, wood cellulose bark, wood chips, or other material acceptable to the Engineer. Mulches shall be clean and free of noxious weeds and deleterious materials. Potable water shall meet the requirements of Subsection 712.01 - Water. Submit alternate sources of irrigation water for the Engineer's acceptance if deviating from 712.01 - Water. Installation and other requirements shall be in accordance with portions of Section 641- Hydro-Mulch Seeding including 641.02(D) - Soil and Mulch Tackifier, 641.03(A) – Seeding, and 641.03(B) - Planting Period. Install non-vegetative controls including mulch or rolled erosion control products while the vegetation is being established. Water and fertilize grass. Apply fertilizer as recommended by the manufacturer. Replace grass the Engineer considers unsuitable or sick. Remove and dispose of trash and debris. Remove invasive species. Mow as needed to prevent site or signage obstructions, fire hazard, or nuisance to the public. Do not remove down stream sediment control measures until the vegetation is uniformly established, including no large bare areas, and provides 70 percent of the density of pre-disturbance vegetation. Temporary vegetative stabilization shall not be used longer than one year.

(D) Silt Fences. Comply with ASTM D6462, Standard Practice for Silt Fence Installation.

Alternative materials or methods to control, prevent, remove and dispose pollution are allowable if acceptable to the Engineer.

209.03 Construction.

(A) Preconstruction Requirements.

(1) Water Pollution, Dust, and Erosion Control Meeting. Schedule a water pollution, dust, and erosion control meeting with the Engineer after Site-Specific BMP is accepted in writing by the Engineer. Meeting shall be scheduled a minimum of 14 calendar days prior to the Start Work Date. Discuss sequence of work, plans and proposals for water pollution, dust, and erosion control.

(2) Water Pollution, Dust, and Erosion Control Submittals. Submit a Site-Specific BMP Plan within 30 calendar days of contract execution. Submission of complete and acceptable Site-Specific BMP Plan is the sole responsibility of the Contractor and additional contract

time will not be issued for delays due to incompleteness. Include the following:

(a) Written description of activities to minimize water pollution and soil erosion into State waters, drainage or sewer systems. BMP shall include the following:

1. An identification of potential pollutants and their sources.

2. A list of all materials and heavy equipment to be used during construction.

3. Descriptions of the methods and devices used to minimize the discharge of pollutants into State waters, drainage or sewer systems.

4. Details of the procedures used for the maintenance and subsequent removal of any erosion or siltation control devices.

5. Methods of removing and disposing hazardous wastes encountered or generated during construction.

6. Methods of removing and disposing concrete and asphalt pavement cutting slurry, concrete curing water, and hydrodemolition water.

7. Spill Control and Prevention and Emergency Spill Response Plan.

8. Fugitive dust control, including dust from grinding, sweeping, or brooming off operations or combination thereof.

9. Methods of storing and handling of oils, paints and other products used for the project.

10. Material storage and handling areas, and other staging areas.

11. Concrete truck washouts.

12. Concrete waste control.

13. Fueling and maintenance of vehicles and other equipment.

14. Tracking of sediment offsite from project entries and exits.

15. Litter management.

16. Toilet facilities.

17. Other factors that may cause water pollution, dust and erosion control.

(b) Provide plans indicating location of water pollution, dust and erosion control devices; provide plans and details of BMPs to be installed or utilized; show areas of soil disturbance in cut and fill, indicate areas used for construction staging and storage including items (1) through (17) above, storage of aggregate (indicate type of aggregate), asphalt cold mix, soil or solid waste, equipment and vehicle parking, and show areas where vegetative practices are to be implemented. Indicate intended drainage pattern on plans. Include flow arrows. Include separate drawing for each phase of construction that alters drainage patterns. Indicate approximate date when device will be installed and removed.

(c) Construction schedule.

(d) Name(s) of specific individual(s) designated responsible for water pollution, dust, and erosion controls on the project site. Include home, cellular, and business telephone numbers, fax numbers, and e-mail addresses.

(e) Description of fill material to be used.

(f) For projects with an NPDES Permit for Construction Activities, submit information to address all sections in the Storm Water Pollution Prevention Plan (SWPPP).

(g) For projects with an NPDES Permit, information required for compliance with the conditions of the Notice of General Permit Coverage (NGPC)/NPDES Permit.

(h) Site-Specific BMP Review Checklist. The checklist may be downloaded from HDOT's Stormwater Management website at http://stormwaterhawaii.com.

Date and sign Site-Specific BMP Plan. Keep accepted copy on site or at an accessible location so that it can be made

available at the time of an on-site inspection or upon request by the Engineer, HDOT Third-Party Inspector, and/or DOH/EPA Representative. Amendments to the Site-Specific BMP Plan shall be included with original Site-Specific BMP Plan. Modify SWPPP if necessary to conform to revisions. Include date of installation and removal of Site-Specific BMP measures. Obtain written acceptance by the Engineer before implementing revised Site-Specific BMPs in the field.

Follow the guidelines in the current HDOT "Construction Best Management Practices Field Manual", in developing, installing, and maintaining Site-Specific BMPs for all projects. For any conflicting requirements between the Manual and applicable bid documents, the applicable bid documents will govern. Should a requirement not be clearly described within the applicable bid documents, notify the Engineer immediately for interpretation. For the purposes of clarification "applicable bid documents" include the construction plans, standard specifications, special provisions, Permits, and the SWPPP when applicable.

Follow Honolulu's City and County "Rules for Soil Erosion Standards and Guidelines" for all projects on Oahu. Use respective Soil Erosion Guidelines for Maui, Kauai and Hawaii projects.

(B) Construction Requirements. Do not begin work until submittals detailed in Subsection 209.03(A)(2) - Water Pollution, Dust, and Erosion Control Submittals are completed and accepted in writing by the Engineer.

Install, maintain, monitor, repair and replace site-specific BMP measures, such as for water pollution, dust and erosion control; installation, monitoring, and operation of hydrotesting activities; removal and disposal of hazardous waste indicated on plans, concrete cutting slurry, concrete curing water; or hydrodemolition water. Site-Specific BMP measures shall be in place, functional and accepted by HDOT personnel prior to initiating any ground disturbing activities.

If necessary, furnish and install rain gage in a secure location prior to field work including installation of site-specific BMP. Provide rain gage with a tolerance of at least 0.05 inches of rainfall. Install rain gage on project site in an area that will not deter rainfall from entering the gate opening. Do not install in a location where rain water may splash into rain gage. The rain gage installation shall be stable and plumbed. Maintain rain gage and replace rain gage that is stolen, does not function properly or accurately, is worn out, or needs to be relocated. Do not begin field work until rain gage is installed and Site-Specific BMPs are in place. Rain gage data logs shall be

readily available. Submit rain gage data logs weekly to the Engineer.

Address all comments received from the Engineer.

Modify and resubmit plans and construction schedules to correct conditions that develop during construction which were unforeseen during the design and pre-construction stages.

Coordinate temporary control provisions with permanent control features throughout the construction and post-construction period.

Limit maximum surface area of earth material exposed at any time to 300,000 square feet. Do not expose or disturb surface area of earth material (including clearing and grubbing) until BMP measures are installed and accepted in writing by the Engineer. Protect temporarily or permanently disturbed soil surface from rainfall impact, runoff and wind before end of the work day.

Immediately initiate stabilizing exposed soil areas upon completion of earth disturbing activities for areas permanently or temporarily ceased on any portion of the site. Earth-disturbing activities have permanently ceased when clearing and excavation within any area of the construction site that will not include permanent structures has been completed. Earth-disturbing activities have temporarily ceased when clearing, grading, and excavation within any area of the site that will not include permanent structures will not resume for a period of 14 or more calendar days, but such activities will resume in the future. The term "immediately" is used in this section to define the deadline for initiating stabilization measures. "Immediately" means as soon as practicable, but no later than the end of the next work day, following the day when the earth-disturbing activities have temporarily or permanently ceased.

For projects with an NPDES Permit for Construction activities:

1) For construction areas discharging into waters not impaired for nutrients or sediments, complete initial stabilization within 14 calendar days after the temporary or permanent cessation of earth-disturbing activities.

2) For construction areas discharging into nutrient or sediment impaired waters, complete initial stabilization within 7 calendar days after the temporary or permanent cessation of earth-disturbing activities.

For projects without an NPDES Permit for Construction activities, complete initial stabilization within 14 calendar days after the temporary or permanent cessation of earth-disturbing activities.

Any of the following types of activities constitutes initiation of stabilization:

(1) Prepping the soil for vegetative or non-vegetative stabilization;

(2) Applying mulch or other non-vegetative product to the exposed area;

(3) Seeding or planting the exposed area;

(4) Starting any of the activities in items (1) – (3) above on a portion of the area to be stabilized, but not on the entire area; and

(5) Finalizing arrangements to have stabilization product fully installed in compliance with the deadline for completing initial stabilization activities.

Any of the following types of activities constitutes completion of initial stabilization activities:

(1) For vegetative stabilization, all activities necessary to initially seed or plant the area to be stabilized; and/or

(2) For non-vegetative stabilization, the installation or application of all such non-vegetative measures.

If the Contractor is unable to meet the deadlines above due to circumstances beyond the Contractor's control, and the Contractor is using vegetative cover for temporary or permanent stabilization, the Contractor may comply with the following stabilization deadlines instead as agreed to by the Engineer:

(1) Immediately initiate, and complete within the timeframe shown above, the installation of temporary non-vegetative stabilization measures to prevent erosion;

(2) Complete all soil conditioning, seeding, watering or irrigation installation, mulching, and other required activities related to the planting and initial establishment of vegetation as soon as conditions or circumstances allow it on the site; and

(3) Notify and provide documentation to the Engineer the circumstances that prevent the Contractor from meeting the deadlines above for stabilization and the schedule the Contractor will follow for initiating and completing initial stabilization and as agreed to by the Engineer.

Follow the applicable requirements of the specifications and special provisions including Section 619 - Planting and Section 641 - Hydro-mulch Seeding.

Immediately after seeding or planting the area to be vegetatively stabilized, to the extent necessary to prevent erosion on the seeded or planted area, select, design, and install non-vegetative erosion controls that provide cover (e.g., mulch, rolled erosion control products) to the area while vegetation is becoming established.

Protect exposed or disturbed surface area with mulches, grass seeds or hydromulch. Spray mulches at a rate of 2,000 pounds per acre. Add tackifier to mix at a rate of 85 pounds per acre. Apply grass seeds at a rate of 125 pounds per acre. For hydromulch, use the ingredients and rates required for mulches and grass seeds. Submit recommendations from a licensed Landscape Architect when deviating from the application rates above.

Apply fertilizer to mulches, grass seed or hydromulch per manufacturer's recommendations. Submit recommendations from a licensed Landscape Architect when deviating from the manufacturer's recommendations.

Install velocity dissipation measures when exposing erodible surfaces greater than 15 feet in height.

BMP measures shall be in place and operational at the end of work day or as required by Section 209.03(B) - Construction Requirements.

Install and maintain either or both stabilized construction entrances and wheel washes to minimize tracking of dirt and mud onto roadways. Restrict traffic to stabilized construction areas only. Clean dirt, mud, or other material tracked onto the road, sidewalk, or other paved area by the end of the same day in which the track-out occurs. Modify stabilized construction entrances to prevent mud from being tracked onto road. Stabilize entire access roads if necessary.

Chemicals may be used as soil stabilizers for either or both erosion and dust control if acceptable to the Engineer.

Provide temporary slope drains of rigid or flexible conduits to carry runoff from cuts and embankments. Provide portable flume at the entrance. Shorten or extend temporary slope drains to ensure proper function.

Protect ditches, channels, and other drainageways leading away from cuts and fills at all times by either:

(1) Hydro-mulching the lower region of embankments in the immediate area.

(2) Installing check dams and siltation control devices.

(3) Other methods acceptable to the Engineer.

Provide for controlled discharge of waters impounded, directed, or controlled by project activities or erosion control measures.

Cover exposed surface of materials completely with tarpaulin or similar device when transporting aggregate, soil, excavated material or material that may be source of fugitive dust.

Cleanup and remove any pollutant that can be attributed to the Contractor.

Install or modify Site-Specific BMP measures due to change in the Contractor's means and methods, or for omitted condition that should have been allowed for in the accepted Site-Specific BMP or a Site-Specific BMP that replaces an accepted Site-Specific BMP that is not satisfactorily performing. Modifications to Site-Specific BMP measures shall be accepted in writing by the Engineer prior to implementation.

Properly maintain all Site-Specific BMP measures.

For projects with an NPDES Permit for Construction Activities:

(1) For construction areas discharging into nutrient or sediment impaired waters, inspect, prepare a written report, and make repairs to BMP measures at the following intervals:

(a) Weekly.

(b) Within 24 hours of any rainfall of 0.25 inch or greater which occurs in a 24-hour period.

(c) When existing erosion control measures are damaged or not operating properly as required by Site-Specific BMP.

(2) For construction areas discharging to waters not impaired for nutrients or sediments, inspect, prepare a written report, and make repairs to BMP measures at the following intervals:

(a) Weekly.

(b) When existing erosion control measures are damaged or

not operating properly as required by Site-Specific BMP.

For projects without an NPDES Permit for Construction activities, inspect, prepare a written report, and make repairs to BMP measures at the following intervals:

(a) Weekly.

(b) When existing erosion control measures are damaged or not operating properly as required by Site-Specific BMP.

Temporarily remove, replace or relocate any Site-Specific BMP that must be removed, replaced or relocated due to potential or actual flooding, or potential danger or damage to project or public.

Maintain records of inspections of Site-Specific BMP work. Keep continuous records for duration of the project. Submit copy of Inspection Report to the Engineer within 24 hours after each inspection.

The Contractor's designated representative specified in Subsection 209.03(A)(2)(d) shall address any Site-Specific BMP deficiencies brought up by the Engineer immediately, including weekends and holidays, and complete work to fix the deficiencies by the close of the next work day if the problem does not require significant repair or replacement, or if the problem can be corrected through routine maintenance. Address any Site-Specific BMP deficiencies brought up by the State's Third-Party Inspector in the timeframe above or as specified in the Consent Decree or MS4 NPDES Permit, whichever is more stringent. The Consent Decree timeframe requirement applies statewide. The MS4 NPDES Permit only applies to Oahu. In this section, "immediately" means the Contractor shall take all reasonable measures to minimize or prevent discharge of pollutants until a permanent solution is installed and made operational. If a problem is identified at a time in the day in which it is too late to initiate repair, initiation of repair shall begin on the following work day. When installation of a new pollution prevention control or a significant repair is needed, complete installation or repair no later than seven calendar days from the time of notification/Contractor discovery. Notify the Engineer and document why it is infeasible to complete the installation or repair within seven calendar days and complete the work as soon as practicable and as agreed to by the Engineer. Address Site-Specific BMP deficiencies discovered by the Contractor within the timeframe above. The Contractor's failure to satisfactorily address these Site-Specific BMP deficiencies, the Engineer reserves the right to employ outside assistance or use the Engineer's own labor forces to provide necessary corrective measures. The Engineer will charge the Contractor such incurred costs plus any associated project engineering costs. The Engineer will make appropriate deductions from the Contractor's monthly progress estimate. Failure to apply Site-Specific BMP

measures may result in one or more of the following: assessment of liquidated damages, suspension, or cancellation of Contract with the Contractor being fully responsible for all additional costs incurred by the State.

(C) Discharges of Storm Water Associated with Construction Activities. If work includes disturbance of one acre or more, an NPDES Permit authorizing Discharges of Storm Water Associated with Construction Activity (CWB-NOI Form C) or Individual Permit authorizing storm water discharges associated with construction activity is required from the Department of Health Clean Water Branch (DOH-CWB).

Do not begin construction activities until all required conditions of the permit are met and submittals detailed in Subsection 209.03(A)(2) – Water Pollution, Dust, and Erosion Control Submittals are completed and accepted in writing by the Engineer.

(D) Discharges Associated with Hydrotesting Activities. If hydrotesting activities require effluent discharge into State waters or drainage systems, an NPDES Hydrotesting Waters Permit (CWB-NOI Form F) or Individual Permit authorizing discharges associated with hydrotesting from DOH-CWB is required from the DOH-CWB.

Do not begin hydrotesting activities until the DOH-CWB has issued an Individual NPDES Permit or Notice of General Permit Coverage (NGPC). Conduct Hydrotesting operations in accordance with the conditions of the permit or NGPC.

(E) Discharges Associated with Dewatering Activities. If dewatering activities require effluent discharge into State waters or drainage systems, an NPDES Dewatering Permit (CWB-NOI Form G) or Individual Permit authorizing discharges associated with dewatering from DOH-CWB is required from the DOH-CWB.

Do not begin dewatering activities until the DOH-CWB has issued an Individual NPDES Permit or Notice of General Permit Coverage (NGPC). Conduct dewatering operations in accordance with the conditions of the permit or NGPC.

(F) Solid Waste. Submit the Solid Waste Disclosure Form for Construction Sites to the Engineer within 30 calendar days of contract execution. Provide a copy of all the disposal receipts from the facility permitted by the Department of Health to receive solid waste to the Engineer monthly. This should also include documentation from any intermediary facility where solid waste is handled or processed, or as directed by the Engineer.

(G) Construction BMP Training. The Contractor's representative responsible for development of the Site-Specific BMP Plan and implementation of Site-Specific BMPs in the field shall attend the State's Construction Best Management Practices Training. The Contractor shall keep training logs updated and readily available.

209.04 Measurement.

(A) Installation, maintenance, monitoring, and removal of BMP will be paid on a lump sum basis. Measurement for payment will not apply.

(B) The Engineer will only measure additional water pollution, dust and erosion control required and requested by the Engineer on a force account basis in accordance with Subsection 109.06 – Force Account Provisions and Compensation.

209.05 Payment. The Engineer will pay for accepted pay items listed below at contract price per pay unit, as shown in the proposal schedule. Payment will be full compensation for work prescribed in this section and contract documents.

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

Pay Item	**Pay Unit**
Installation, Maintenance, Monitoring, and Removal of BMP	Lump Sum
Additional Water Pollution, Dust, and Erosion Control	Force Account

An estimated amount for force account is allocated in proposal schedule under 'Additional Water Pollution, Dust, and Erosion Control', but actual amount to be paid will be the sum shown on accepted force account records, whether this sum be more or less than estimated amount allocated in proposal schedule. The Engineer will pay for BMP measures requested by the Engineer that are beyond scope of accepted Site-Specific BMP on a force account basis.

No progress payment will be authorized until the Engineer accepts in writing Site-Specific BMP or when the Contractor fails to maintain project site in accordance with accepted BMP.

For all citations or fines received by the Department for non-compliance, including compliance with NPDES Permit conditions, the Contractor shall reimburse State within 30 calendar days for full amount of outstanding cost State has incurred, or the Engineer will deduct cost from progress payment.

The Engineer will assess liquidated damages up to $27,500 per day for non-compliance of each BMP requirement and all other requirements in this section.

Appendix A

The following list identifies potential pollutant sources and corresponding BMPs used to mitigate the pollutants. Each BMP is referenced to the corresponding section of the current HDOT Construction Best Management Practices Field Manual or appropriate Supplemental Sheets. The Manual may be obtained from the HDOT Statewide Stormwater Management Program Website at *http://www.stormwaterhawaii.com/resources/contractors-and-consultants/* under Construction Best Management Practices Field Manual. Supplemental BMP sheets are located at *http://www.stormwaterhawaii.com/resources/contractors-and-consultants/storm-water-pollution-prevention-plan-swppp/* under Concrete Curing and Irrigation Water.

Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
Construction debris, green waste, general litter	• *Separate contaminated clean up materials from construction and demolition (C&D) wastes.* • *Provide waste containers (e.g., dumpster or trash receptacle) of sufficient size and number to contain construction and domestic wastes.* • *Inspect construction waste and recycling areas regularly.* • *Schedule solid waste collection regularly.* • *Schedule recycling activities based on construction/demolition phases.* • *Empty waste containers weekly or when they are two-thirds full, whichever is sooner.* • *Do not allow containers to overflow. Clean up immediately if they do.* • *On work days, clean up and dispose of waste in designated waste containers.* • *See Solid Waste Management Section SM-6 for additional requirements.* • *Provide Storm Drain Inlet Protection and/or Perimeter Sediment Controls as applicable.*	*See Solid Waste Management Section SM-6. Protect Storm Drain Inlets SC-2, and Perimeter Sediment Controls where applicable.*
Materials associated with the operation and maintenance of equipment, such as oil, fuel, and hydraulic fluid leakage	• *Use off-site wash racks, repair and maintenance facilities, and fueling sites when practical.* • *Designate bermed wash area if cleaning on site is necessary.* • *Place drip pans or drop cloths under vehicles and equipment to absorb spills or leaks.* • *Provide an ample supply of readily available spill cleanup materials.* • *Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly.* • *Do not clean surfaces or spills by hosing the area down.* • *Eliminate the source of the spill to prevent a discharge or a continuation of an ongoing discharge.* • *Inspect on-site vehicles and equipment regularly and immediately repair leaks.* • *Regularly inspect fueling areas and storage tanks.*	*See Vehicle and Equipment Cleaning, Maintenance, and Refueling, Sections SM-11, SM-12, and SM-13, and Material Delivery, Storage and Material Use Sections SM-2 and SM-3, and Spill Prevention and Control SM-10.*

Pollutant Source	*Appropriate Site-Specific BMP to be Implemented*	*BMP Requirements*
	• *Train employees on proper maintenance and spill practices and procedures and fueling and cleanup procedures.* • *Store diesel fuel, oil, hydraulic fluid, or other petroleum products or other chemicals in water-tight containers and provide cover or secondary containment.* • *Do not remove original product labels and comply with manufacturer's labels for proper disposal.* • *Dispose of containers only after all the product has been used.* • *Dispose of or recycle oil or oily wastes according to Federal, State, and Local requirements.* • *Store soaps, detergents, or solvents under cover or other means to prevent contact with rainwater.* • *See Vehicle and Equipment Cleaning, Maintenance, and Refueling, Sections SM-11, SM-12, and SM-13 and Material Use Section SM-3 for additional requirements.*	

Pollutant Source	***Appropriate Site-Specific BMP to be Implemented***	***BMP Requirements***
Soil erosion from the disturbed areas	• *Provide Soil Stabilization, Slope Protection, Storm Drain Inlet Protection SC-2, Perimeter Controls and Sediment Barriers, Sediment Basins and Detention Ponds, Check Dams SC-9 ,Level Spreader SC-10, Paving Operations SM-19, Construction Road Stabilization EC-1, Controlling Storm Water Flowing Onto and Through the Project, Post-Construction BMPs, and Non-Structural BMPs (Employee Training SM-1, Scheduling SM-14, Location of Potential Sources of Sediment SM-15, Preservation of Existing Vegetation SM-16) .* • *Delineate, and clearly mark off, with flags, tape, or other similar marking device all natural buffer areas defined in the SWPPP.* • *Preserve native topsoil where practicable.* • *In areas where vegetative stabilization will occur, restrict vehicle/equipment use in areas to avoid soil compaction or condition soil to promote vegetative growth.* • *For Storm Drain Inlet Protection, clean, or remove and replace, the protection measures as sediment accumulates, the filter becomes clogged, and/or performance is compromised.* • *Where there is evidence of sediment accumulation adjacent to the inlet protection measure, remove the deposited sediment by the end of the same day in which it is found or by the end of the following work day if removal by the same day is not feasible.* • *Sediment basins shall be designed and maintained in accordance with HAR 11-55.* • *Minimize disturbance on steep slopes (Greater than 15% in grade).* • *If disturbance of steep slopes are unavoidable, phase disturbances and use stabilization techniques*	*Soil Stabilization* 1. *SM-21 Topsoil Management* 2. *EC-5 Seeding and Planting* 3. *EC-6 Mulching* 4. *EC-7 Geotextiles and Mats* *Slope Protection* 1. *EC-5 Seeding and Planting* 2. *EC-6 Mulching* 3. *EC-7 Geotextiles and Mats* 4. *EC-9 Slope Roughening, Terracing, and Rounding* 5. *SC-11 Slope Drains and Subsurface Drains* 6. *SC-12 Top and Toe of Slope Diversion Ditches*

Pollutant Source	*Appropriate Site-Specific BMP to be Implemented*	*BMP Requirements*
	designed for steep grades. • *For temporary drains and swales use velocity dissipation devices within and at the outlet to minimize erosive flow velocities.*	*and Berms* *SC-2 Storm Drain Inlet Protection* *Perimeter Controls and Sediment Barriers* *1. SC-1 Silt Fence* *2. SC-5 Vegetated Filter Strips and Buffers* *3. SC-8 Compost Filter Berm* *4. SC-13 Sandbag Barrier* *5. SC-14 Brush or Rock Filter* *Sediment Basins and Detention Ponds* *1. SC-15 Sediment Trap* *2. SC-16 Sediment Basin* *SC-9 Check Dams* *SC-10 Level Spreader*

Pollutant Source	*Appropriate Site-Specific BMP to be Implemented*	*BMP Requirements*
		SM-19 Paving Operations *EC-1 Construction Road Stabilization* *Controlling Storm Water Flowing onto and Through the Project* 1. *EC-8 Run-On Diversion* 2. *SC-6 Earth Dike* 3. *SC-7 Temporary Drains and Swales* *Post Construction BMPs* 1. *EC-4 Flared Culvert End Sections* 2. *SC-3 Rip-Rap and Gabion Inflow Protection* 3. *SC-4 Outlet Protection and Velocity Dissipation*

Pollutant Source	*Appropriate Site-Specific BMP to be Implemented*	*BMP Requirements*
		Devices *4. SM-21 Topsoil Management* *Non-Structural BMPs* *1. SM-1 Employee Training* *2. SM-14 Scheduling* *3. SM-15 Location of Potential Sources of Sediment* *4. SM-16 Preservation of Existing Vegetation*

Pollutant Source	*Appropriate Site-Specific BMP to be Implemented*	*BMP Requirements*
Sediment from soil stockpiles	• *Locate stockpiles a minimum of 50 feet or as far as practicable from concentrated runoff or outside of any natural buffers identified on the SWPPP.* • *Place bagged materials on pallets and under cover.* • *Provide physical diversion to protect stockpiles from concentrated runoff.* • *Cover stockpiles with plastic or comparable material when practicable.* • *Place silt fence, fiber filtration tubes, or straw wattles around stockpiles.* • *Do not hose down or sweep soil or sediment accumulated on pavement or other impervious surfaces into any storm water conveyance (unless connected to a sediment basin, sediment trap, or similarly effective control), storm drain inlet, or state water.* • *Unless infeasible, contain and securely protect stockpiles from the wind.* • *Provide Storm Drain Inlet Protection and/or Perimeter Sediment Controls as applicable.* • *See Protection of Stockpiles Section SM-4 for additional requirements.*	*See Protection of Stockpiles Section SM-4. Protect Storm Drain Inlets SC-2, and Perimeter Sediment Controls where applicable.*
Emulsified asphalt or prime/tack coat	• *Provide training for employees and contractors on proper material delivery and storage practices and procedures.* • *Restrict paving operations during wet weather to prevent paving materials from being discharged.* • *Use asphalt emulsions such as prime coat when possible.* • *Protect drain inlet structures and manholes during application of tack coat, seal coat, slurry seal, and fog seal.* • *Keep ample supplies of drip pans and absorbent materials on site.* • *Inspect inlet protection devices.* • *See Material Delivery and Storage Section SM-2 and Paving Operations Section SM-19 for additional requirements.* • *Provide Storm Drain Inlet Protection and/or*	*See Material Delivery and Storage Section SM-2 and Material Use Section SM-3, Paving Operations Section SM-19, Protect Storm Drain Inlets SC-2, and Perimeter Sediment Controls where*

Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
	Perimeter Sediment Controls as applicable.	applicable.
Materials associated with painting, such as paint and paint wash solvent	• Hazardous chemicals shall be well-labeled and stored in original containers. • Keep ample supply of cleanup materials on site. • Dispose container only after all of the product has been used. • Remove as much paint from brushes on painted surface.. • Rinse from water-based paints shall be discharged into the sanitary sewer system where possible. If not, direct all washwater into a leak-proof container or leak-proof pit. The container or pit must be designed so that no overflows can occur due to inadequate sizing or precipitation. • Locate on-site wash area a minimum of 50 feet away or as far as practicable from storm drain inlets, open drainage facilities, or water bodies. • . Do not dump liquid wastes into the storm drainage system. • Filter and re-use solvents and thinners. • Dispose of oil-based paints and residue as a hazardous waste. • Ensure collection, removal, and disposal of hazardous waste complies with regulations. • Immediately clean up spills and leaks. • Properly store paints, solvents, and epoxy compounds. • Properly store and dispose waste materials generated from painting and structure repair and construction activities. • Mix paints in a covered and contained area when possible to minimize adverse impacts from spills. • Do not apply traffic paint or thermoplastic if rain is forecasted. • See Material Delivery and Storage Section SM-2, Material Use SM-3, Waste Management, Hazardous Waste Management Section SM-9, Waste Management, Spill Prevention and Control Section SM-10, and Structure Construction and Painting Section SM-20 for additional requirements.	See Material Delivery and Storage Section SM-2, Material Use Section SM-3, Hazardous Waste Management Section SM-9, Waste Management, Spill Prevention and Control Section SM-10, and Structure Construction and Painting Section SM-20, Protect Storm Drain Inlets SC-2, and Perimeter Sediment Controls where applicable.

Pollutant Source	*Appropriate Site-Specific BMP to be Implemented*	*BMP Requirements*
	• *Provide Storm Drain Inlet Protection and/or Perimeter Sediment Controls as applicable.*	
Industrial chemicals, fertilizers, and/or pesticides	• *Hazardous chemicals shall be well-labeled and stored in original containers.* • *Keep ample supply of cleanup materials on site.* • *Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly.* • *Do not clean surfaces or spills by hosing the area down.* • *Eliminate the source of the spill to prevent a discharge or a furtherance of an ongoing discharge.* • *Dispose container only after all of the product has been used.* • *Retain a complete set of material safety data sheets on site.* • *Store industrial chemicals in water-tight containers and provide either cover or secondary containment.* • *Provide cover when storing fertilizers or pesticides to prevent these chemicals from coming into contact with rainwater.* • *Restrict amount of pesticide prepared to quantity necessary for the current application.* • *Do not apply fertilizers or pesticides during or just before a rain event.* • *Do not apply to stormwater conveyance channels with flowing water.* • *Comply with fertilizer and pesticide manufacturer's recommended usage instructions.* • *Follow federal, state, and local laws regarding fertilizer application.* • *Do not dispose of toxic liquid wastes (solvents, used oils, and paints) or chemicals (additives, acids, and curing compounds) in dumpsters allocated for construction debris.* • *Ensure collection, removal, and disposal of hazardous waste complies with regulations. Hazardous waste that cannot be reused or recycled shall be disposed of by a licensed hazardous waste hauler.* • *See Material Delivery and Storage Section SM2,*	*See Material Delivery and Storage Section SM-2, Material Use Section SM-3, and Hazardous Waste Management Section SM-9, and Spill Prevention and Control SM-10*

Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
	Material Use SM-3, and Waste Management, Hazardous Waste Management Section SM-9 for additional requirements.	
Hazardous waste (Batteries, Solvents, Treated Lumber, etc.)	• *Do not dispose of toxic materials in dumpsters allocated for construction debris.* • *Ensure collection, removal, and disposal of hazardous waste complies with regulations.* • *Hazardous waste that cannot be reused or recycled shall be disposed of by a licensed hazardous waste hauler.* • *Segregate and recycle wastes from vehicle/equipment maintenance activities such as used oil or oil filters, greases, cleaning solutions, antifreeze, automotive batteries, and hydraulic and transmission fluids.* • *Store waste in sealed containers, which are constructed of suitable materials to prevent leakage and corrosion, and which are labeled in accordance with applicable Resource Conservation and Recovery Act (RCRA) requirements and all other applicable federal, state, and local requirements.* • *All containers stored outside shall be kept away from surface waters and within appropriately-sized secondary containment (e.g., spill berms, decks, spill containment pallets). Provide cover if possible.* • *Clean up spills immediately, using dry clean-up methods where possible, and dispose of used materials properly.* • *Do not clean surfaces or spills by hosing the area down.* • *Eliminate the source of the spill to prevent a discharge or a continuation of an ongoing discharge.* • *Ensure collection, removal, and disposal of hazardous waste complies with manufacturer's recommendations and is in compliance with federal, state, and local requirements.* • *See Hazardous Waste Management Section SM-9 and Vehicle and Equipment Management, Vehicle and Equipment Maintenance SM-12 for additional requirements.*	*See Hazardous Waste Management Section SM-9 and Vehicle and Equipment Maintenance SM-12*
Metals and	• *Inspect construction waste and recycling areas*	*See Solid*

Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
Building Materials	*regularly.* • *Schedule solid waste collection regularly.* • *If building materials or metals are stored on site (such as rebar or galvanized poles) store under cover under tarps or in containers.* • *Minimize the amount of material stored on site.* • *Do not stockpile uncovered metals or other building materials in close proximity to discharge points.* • *See Solid Waste Management Section SM-6 for additional requirements.*	*Waste Management Section SM-6*
Contaminated Soil	• *See Waste Management, Contaminated Soil Management Section SM-8 and/or Hazardous Waste Management Section SM-9 for additional requirements.* • *At minimum contain contaminated material soil by surrounding with impermeable lined berms or cover exposed contaminated material with plastic sheets.*	*See Waste Management, Contaminated Soil Management Section SM-8 and/or Hazardous Waste Management Section SM-9*
Dust Control Water	• *Do not over spray water for dust control purposes which will result in runoff from the area.* • *Apply water as conditions require.* • *Washing down of debris or dirt into drainage, sewage systems, or State waters is not allowed.* • *See Dust Control Section SM-18 for additional requirements.*	*See Dust Control Section SM-18*
Concrete Truck Wash Water	• *Disposal of concrete truck wash water via percolation is prohibited.* • *Wash concrete-coated vehicles or equipment off-site or in the designated wash area.* • *Locate on-site wash area a minimum of 50 feet*	*See Waste Management, Concrete Waste Management*

Pollutant Source	*Appropriate Site-Specific BMP to be Implemented*	*BMP Requirements*
	away or as far as practicable from storm drain inlets, open drainage facilities, or water bodies. • *Runoff from the on-site concrete wash area shall be contained in a temporary pit or level bermed area where the concrete can set.* • *Design the area so that no overflow can occur due to inadequate wash area sizing or precipitation.* • *The temporary pit shall be lined with plastic to prevent seepage of wash water into the ground.* • *Allow wash water to evaporate or collect wash water and all concrete debris in a concrete washout system bin.* • *Do not dump liquid wastes into storm drainage system.* • *Dispose of liquid and solid concrete wastes in compliance with federal, state, and local standards.* • *See Waste Management, Concrete Waste Management Section SM-5 for additional requirements.*	*Section SM-5*

Pollutant Source	***Appropriate Site-Specific BMP to be Implemented***	***BMP Requirements***
Sediment Track-Out	• *Include Stabilized Construction Entrance at all points that exit onto paved roads.* • *A sediment trapping device is required if a wash rack is used in conjunction with the stabilized construction entrance/exit.* • *The pavement shall not be cleaned by washing down the street.* • *If sweeping is ineffective or it is necessary to wash the streets, wash water must be contained either by construction of a sump, diverting the water to an acceptable disposal area, or vacuuming the wash water.* • *Use BMPs for adjacent drainage structures.* • *Remove sediment tracked onto the street by the end of the day in which the track-out occurs.* • *Restrict vehicle use to properly designated exit points.* • *Include additional BMPs which remove sediment prior to exit when minimum dimensions can not be met.* • *See Stabilized Construction Entrance Section EC-2 for additional requirements.*	*See Stabilized Construction Entrance Section EC-2*
Irrigation Water	• *Consider irrigation requirements.* • *Where possible, avoid species which require irrigation.* • *Design timing and application methods of irrigation water to eliminate the runoff of excess irrigation water into the storm water drainage system.* • *See Seeding and Planting Section EC-5 and California Stormwater BMP Handbook SD-12 Efficient Irrigation at http://www.stormwaterhawaii.com/resources/contract*	*See Seeding and Planting Section EC-5 and California Stormwater BMP Handbook SD-12 Efficient Irrigation*

Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
	ors-and-consultants/storm-water-pollution-prevention-plan-swppp/ under Irrigation Water for additional requirements.	
Hydrotesting Effluent	• *If work includes removing, relocation or installing waterlines, and Contractor elects to flush waterline or discharge hydrotesting effluent into State waters or drainage systems, the Contractor shall prepare and obtain HDOT acceptance of a NOI/NPDES Permit Form F application for HDOT submittal to DOH CWB at least 30 calendar days prior to the start of Hydrotesting Activities if necessary. Site-Specific BMPs will be included in the NOI/NPDES Permit Form F submittal.*	*Site-Specific BMPs will be included in the NOI/NPDES Permit Form F submittal.*
Dewatering Effluent	• *If excavation or backfilling operations require dewatering, and Contractor elects to discharge dewatering effluent into State waters or existing drainage systems, Contractor shall prepare and obtain HDOT acceptance of a NOI/NPDES Permit Form G application for HDOT submittal to DOH CWB at least 30 calendar days prior to the start of Dewatering Activities if necessary. See Site Planning and General Practices, Dewatering Operations Section SM-17 for additional requirements.*	*See Dewatering Operations SM-17. Site-Specific BMPs will be included in the NOI/NPDES Permit Form G submittal.*
Saw-cutting Slurry	• *Saw cut slurry shall be removed from the site by vacuuming.* • *Provide storm drain protection during saw cutting. See Paving Operations Section SM-19 for additional requirements.* • *Provide Storm Drain Inlet Protection and/or Perimeter Sediment Controls as applicable.*	*See Paving Operations Section SM-19, Storm Drain Inlet Protection SC-2, Perimeter sediment controls where applicable*

Pollutant Source	***Appropriate Site-Specific BMP to be Implemented***	***BMP Requirements***
Concrete Curing Water	• *Avoid overspraying of curing compounds.* • *Apply an amount of compound that covers the surface, but does not allow any runoff of the compound.* • *See California Stormwater BMP Handbook NS-12 Concrete Curing at http://www.stormwaterhawaii.com/resources/contractors-and-consultants/storm-water-pollution-prevention-plan-swppp/ under Concrete Curing for additional requirements.*	*See California Stormwater BMP Handbook NS-12 Concrete Curing*
Plaster Waste Water	• *Direct all washwater into a leak-proof container or leak-proof pit. The container or pit must be designed so that no overflows can occur due to inadequate sizing or precipitation.* • *Locate on-site wash area a minimum of 50 feet away or as far as practicable from storm drain inlets, open drainage facilities, or water bodies.* • *Any significant residual materials remaining on the ground after the completion of construction shall be removed and properly disposed. If the residual materials contaminate the soil, then the contaminated soil shall also be removed and properly disposed of.* • *Plaster waste water shall not be allowed to flow into drainage structures or State waters.* • *See Material Delivery and Storage Section SM-2, Material Use SM-3, and Hazardous Waste Management Section SM-9 for additional requirements.*	*See Material Delivery and Storage Section SM-2, Material Use Section SM-3, and Hazardous Waste Management Section SM-9*

Pollutant Source	*Appropriate Site-Specific BMP to be Implemented*	*BMP Requirements*
Water-Jet Wash Water	• *For Water-Jet Wash Water used to clean vehicles, use off site wash racks or commercial washing facilities when practical.* • *See Vehicle and Equipment Cleaning Section SM-11 for additional information.* • *For Water-Jet Wash Water used to clean impervious surfaces, the runoff shall not be allowed to flow into drainage structures or State Waters.*	*See Vehicle and Equipment Cleaning Section SM-11*
Sanitary/Septic Waste	• *Locate Sanitary facilities in a convenient place away from drainage facilities.* • *Position sanitary facilities so they are secure and will not be tipped over or knocked down.* • *Wastewater shall not be discharged to the ground or buried.* • *A licensed service provider shall maintain sanitary/septic facilities in good working order.* • *Schedule regular waste collection by a licensed transporter.* • *See Sanitary/Septic Waste Section SM-7 for additional requirements.*	*See Sanitary/Septic Waste Section SM-7.*

"

END OF SECTION 209

SECTION 301 – HOT MIX ASPHALT BASE COURSE

Make the following amendments to said Sections:

(I) Amend **Section 301.03(B) Compaction** by revising the second paragraph from lines 84 to 87 to read as follows:

"Compact mixture immediately upon completion of spreading operations to density of not less than 92.0 percent of maximum theoretical specific gravity in accordance with AASHTO T 209, modified by deletion of Supplemental Procedure for Mixtures Containing Porous Aggregate."

(II) Amend **Section 301.04 Measurement** from lines 98 to 100 to read as follows:

"**301.04 Measurement.**

(A) The Engineer will measure HMAB course per ton in accordance with contract documents."

(III) Amend **Section 301.05 Payment,** from lines 102 to 111 to read as follows:

"**301.05 Payment.** The Engineer will pay for the accepted pay items listed below at the contract price per pay unit, as shown in the proposal schedule. Payment will be full compensation for the work prescribed in this section and the contract documents.

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

	Pay Item	**Pay Unit**
(A)	Hot Mix Asphalt Base Course	Ton

(1) 80% of the contract unit price upon completion of submitting a job-mix formula acceptable to the Engineer; preparing the surface, spreading, and finishing the mixture; and compacting the mixture by rolling;

(2) 20% of the contract unit price upon completion of cutting samples from the compacted pavement for testing; placing and

compacting the sampled area with new material conforming to the surrounding area; protecting the pavement; and final analysis.

The Engineer may, in lieu of requiring removal and replacement, use the sliding scale factor to accept HMAB compacted below 92.0 percent. The Engineer will make payment for the material in that production day at a reduced price arrived at by multiplying the contract unit price by the pay factor shown in Table 301.05-1.

Table 301.05-1 – Sliding Scale Pay Factor

Percent Compaction	Percent Payment
93.0 or greater	100
90.0 – less than 93.0	80
<90.0	Removal

"

END OF SECTION 301

SECTION 401 – HOT MIX ASPHALT (HMA) PAVEMENT

Make the following amendments to said Sections:

(I) Amend **Section 401.02 Materials**, by adding the following after line 14:

"Warm Mix Asphalt Additive 702.06"

(II) Amend **Section 401.02(A) General**, by adding the following paragraph after line 24:

"The manufacture of HMA may include warm mix asphalt (WMA) processes in accordance with these specifications. WMA processes include combinations of organic additives, chemical additives, and foaming."

(III) Amend **Section 401.02(A) General**, by replacing lines 36 - 37 to read as follows:

"In surface and binder courses, aggregate for HMA may include RAP quantities up to 20 percent of total mix weight."

(IV) Amend **Section 401.02(C) Submittals**, by adding the following paragraph after line 89:

"The Contractor may use warm mix asphalt (WMA) processes in the production of HMA. The Contractor shall submit to the Engineer for approval, the proposed process and how it will be used in the manufacture of HMA. The process submittal shall include the temperature range of the WMA."

(V) Amend **Section 401.03(B)(3) Asphalt Pavers**, from line 200 to include the following:

"**(h)** Equipped with a mean of preventing the segregation of the coarse aggregate particles from the remainder of the bituminous plant mix when that mix is carried from the paver hopper back to the paver augers. The means and methods used shall be approved by the paver manufacturer and may consist of chain curtains, deflector plates, or other such devices and any combination of these.

The following specific requirements shall apply to the identified bituminous pavers:

(1) Blaw-Knox bituminous pavers shall be equipped with the Blaw-Knox Materials Management Kit (MMK).

(2) Cedarapids bituminous pavers shall be those that were manufactured in 1989 or later.

(3) Barber-Green/Caterpillar bituminous pavers shall be equipped with deflector plates as identified in the December 2000 Service Magazine entitled "New Asphalt Deflector Kit {6630, 6631, 6640}".

(4) Bituminous pavers not listed above shall have similar attachments or designs that shall make them equivalent to the bituminous pavers above. The Engineer will solely decide if it is equal to or better than the setups described for the equipment listed above.

Prior to the start of using the paver for placing plant mix, the Contractor shall submit for approval a full description in writing of the means and methodologies that will be used to prevent bituminous paver segregation. Use of the paver shall not commence prior to receiving approval from the Engineer.

The Contractor shall supply a Certificate of Compliance that verifies that the approved means and methods used to prevent bituminous paver segregation have been implemented on all pavers used on the project and is working in accordance with the manufacturer's requirements."

(VI) Amend **Section 401.03(F)(1) HMA Pavement Courses One and a Half Inches Thick Or Greater**, from lines 499 to 505 to read as follows:

"**(1) HMA Pavement Courses One and a Half Inches Thick Or Greater.** Where HMA pavement compacted thickness indicated in the contract documents is 1-1/2 inches or greater, compact to not less than 93.0 percent nor greater than 97.0 percent of the maximum specific gravity determined in accordance with AASHTO T 209, modified by deletion of Supplemental Procedure for Mixtures Containing Porous Aggregate."

(VII) Amend **Section 401.03(F)(3) HMA Pavement Courses One and a Half Inches Thick or Greater In Special Areas Not Designated For Vehicular Traffic**, from lines 530 to 538 to read as follows:

> "**(3) HMA Pavement Courses One and a Half Inches Thick or Greater In Special Areas Not Designated For Vehicular Traffic.** For areas such as bikeways that are not part of roadway and other areas not subjected to vehicular traffic, compact to not less that 90.0 percent of maximum specific gravity determined in accordance with AASHTO T 209, modified by deletion of Supplemental Procedure for Mixtures Containing Porous Aggregate. Increase asphalt content by at least 0.5 percent above that used for HMA pavements designed for vehicular traffic."

(VIII) Amend **Section 401.04 Measurement**, from lines 597 to 603 to read as follows:

"**401.04 Measurement.**

(A) The Engineer will measure asphalt concrete pavement per ton in accordance with the contract documents.

(IX) Amend **Section 401.05 Payment**, from lines 605 to 635, to read as follows:

"**401.05 Payment.** The Engineer will pay for the accepted pay items listed below at the contract price per pay unit, as shown in the proposal schedule. Payment will be full compensation for the work prescribed in this section and the contract documents.

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

Pay Item	**Pay Unit**
(A) HMA Pavement, Mix No. IV	Ton

The Engineer will pay for cold planing in accordance with and under Section 415 – Cold Planing of Existing Pavement.

The Engineer will pay for adjusting existing frames and covers and valve boxes in accordance with and under Section 604 – Manholes, Inlets and Catch

Basins and Section 626 – Manholes and Valve Boxes for Water and Sewer Systems.

The Engineer may, in lieu of requiring removal and replacement, use the sliding scale factor to accept HMA pavements compacted below 93.0 percent and above 97.0 percent. The Engineer will make payment for the material in that production day at a reduced price arrived at by multiplying the contract unit price by the pay factor shown in Table 401.05-1.

Table 401.05-1 – Sliding Scale Pay Factor for Compaction

Percent Compaction	Percentage Payment
> 98.0	Removal
97.1 - 98.0	95
93.0 - 97.0	100
90.0 - <93.0	80
<90.0	Removal

"

END OF SECTION 401

Make the following Section a part of the Standard Specifications:

"SECTION 615 – PRECAST CONCRETE FOUNDATIONS

615.01 Description. This section describes the furnishing and installing of precast concrete foundations, including assembly and erection.

(A) Work includes preparing foundation soil, installing the foundation and backfilling.

(B) Work includes the design of precast members in accordance with ACI 318 and PCI MNL-120. Design precast members for handling without cracking in accordance with PCI MNL – 120.

615.02 Materials

Structural Concrete; Provide precast concrete units with a minimum 28-day compressive strength of 4,000 psi 601

Reinforcing Steel 602

615.03 Construction

(A) Submittals/Certification. Submit drawings and design calculations indicating complete information for the fabrication, handling, and erection of the precast member. Drawings shall not be reproductions of the contract drawings. Design calculations and drawings of precast members shall be stamped and signed by a Hawaii Licensed Engineer experienced in the design of precast concrete members and submitted for approval prior to fabrication. The drawings shall indicate, as a minimum. The following information:

(1) Member piece marks

(2) Connections between members and other construction

(3) Dimensioned size and shape for each member with quantities, position and other details of reinforcing steel, anchors, inserts and other embedded items

(4) Erection sequences and handling requirements

(5) Lifting and erection insets

(6) Strength properties for concrete, steel and other materials

(7) Methods for storage and transportation

(8) Description of loose, cast-in and field hardware

Submit copies of laboratory test reports showing that the mix has been successfully tested to produce concrete with the properties specified and that mix will be suitable of the job conditions. The laboratory tests reports shall include mill test and all other test for cement, aggregates, and admixtures. Provide maximum nominal aggregate size, gradation analysis, percentage retained and passing sieve size. Test reports shall be submitted along with the concrete mix design. Obtain approval before concrete placement.

(B) Delivery, Storage and Handling. Do not ship precast concrete members until concrete cylinder tests, manufactured of the same concrete and cured under the same conditions as the members, indicate that the concrete in each member has attained the minimum required design strength and is at least 7-days-old.

Store, transport, and erect precast units in the upright position with the points of support and directions of the reactions, with respect to the member, approximately the same as when the member is in its final position. Prevent cracking or damage during storage, hoisting, and handling of the precast units.

Replace units damaged by improper storage or handling. Contractor shall check all materials upon delivery to assure that the proper type and certification have been received.

Contractor shall protect all materials from damage due to jobsite conditions and in accordance with manufacturer's recommendations. Damaged materials shall not be incorporated into the work.

(C) General. Excavate and backfill in accordance with Section 204 – Excavation and Backfill for Miscellaneous Facilities.

Conform concrete construction to section 503 – Concrete Structures.

Conform reinforcing steel work to section 602 – Reinforcing Steel.

Use certified welders to do shop and field wielding in accordance with Section 501 – Steel Structures.

Furnish and install structures as precast units. Submit shop drawings and calculations for acceptance by Engineer prior to construction.

(D) Excavation and Backfill. Excavate and backfill in accordance with Section 204 – Excavation and Backfill for Miscellaneous Facilities.

(E) Bearing Surfaces. Shall be flat, free of irregularities and properly sized. Correct bearing surface irregularities with nonshrink grout. Provide bearing pads where indicated or required. Do not use hardboard bearing pads in exterior locations. Place precast members at right angles to the bearing surface, unless indicated otherwise, and draw-up tight without forcing or distortion, with sides plumb.

(F) Erection. Precast members shall be erected after the concrete has attained the specified compressive strength, unless otherwise approved by the precast manufacturer. Erect in accordance with the approved shop drawings. PCI MNL – 116 and PCI MNL – 120 (Chapter 8), for tolerances. Provide 1:500 tolerance, if no tolerance is specified. Place precast members level, plumb, square, and true within tolerances.

(G) Examination. Prior to erection, and again after installation, precast members shall be checked for damage, such as cracking, spalling and honeycombing.

All honeycombed areas, chipped corners, airpockets over ¼" in diameter and other minor defects involving less than 36 square inches of concrete shall be repaired. All unsound concrete shall be removed from defective areas prior to repairing. All surfaces permanently exposed to view shall be repaired by a blend of Portland cement and white cement properly proportioned so that the final color when cured will be same as the adjacent concrete.

Major defects are those which involve more than 36 square inches of concrete or expose reinforcing steel. If one or more major defects appear in a member, it shall be rejected. Cracks of a width of more than 0.01 inch shall be cause for rejection of a member.

615.04 Measurement. The Engineer will not measure precast concrete foundations for payment.

615.05 Payment. The Engineer shall consider the cost for the accepted precast concrete foundations as included in the contract price of the various contract items. The cost is for the work prescribed in this section and the contract documents."

END OF SECTION 615

SECTION 623 – TRAFFIC SIGNAL SYSTEM

Make the following amendment to said Section:

(l) Amend **623.01 Description** from lines 4 to 5 to read as follows:

"**623.01 Description**. This work includes furnishing labor, materials, tools, machinery, and equipment necessary to modify or install and construct an operating traffic signal system, including trenching, excavation and backfill, asphalt concrete pavement, aggregate base course, and aggregate subbase course, complete in place according to the contract.

The traffic signal system includes:

(1) trenching, structural excavating, backfilling, restoration work, and installing pullboxes;

(2) providing a complete and operating traffic signal system with controller, software, cabinet, and auxiliary and support equipment, vehicle detectors, pole mounted span wire system, traffic signals and appurtenances, signal head mounting, emergency vehicle preemption optical receivers, concrete foundations, cables, wiring, cleaning and adjusting signal heads, painting and restoration work.

(3) coordinating work and arranging for inspection of work with the Engineer and other agencies as required.

(4) turning over to HDOT a complete and operating traffic signal system according to the contract.

(5) Installing the electrical service and metering facilities and paying for the electric company's charges.

Furnish and install the incidental parts that the contract does not show and that are necessary to complete the traffic signal system as though such parts were in the contract.

Electrical equipment shall conform to the NEMA Standards and this contact. Material and workmanship shall conform to the "National Electric 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.

(II) Amend **623.02 Materials** by adding the following sentences after line 102:

Precast Concrete Foundations	615

(III) Amend **623.02 Materials** line 111 to read as follows:

Temporary Traffic Signal Poles (Wood)	770.01

(IV) Amend **623.02 Materials** by adding the following sentences after line 131:

Uninterruptible Power Supply (UPS)	770.12
CCTV Camera Assembly	770.13
Pod Wireless Detection System	770.14
Span Wire Assembly	770.15

(V) Amend **623.02 Materials** by adding the following sentences after line 151:

(F) Local Joint Pole Agreements.

(G) Applicable Federal Specifications.

(H) Applicable standards of the Institute of Transportation Engineers (ITE).

(I) Applicable provisions of the Manual on Uniform Traffic Control Devices (MUTCD) of the Federal Highway Administration.

(VI) Amend **623.03(C)(1) Foundations** by adding the following sentence after line 214:

"Precast concrete foundations shall conform to Special Provisions Section 615 – Precast Concrete Foundations."

(VII) Amend **623.03(C)(2) Metal Traffic Signal Standards** from lines 216 to 224 to read as follows:

"(2) Temporary Traffic Signal Poles (Wood). Install temporary traffic signal poles (wood) and attach span wire assembly as shown on the plans. Locations of poles indicated in the contract documents are approximate. Set poles at required locations or as ordered by the Engineer."

(VIII) Amend **623.03(C)(5) Vehicle Detectors** from lines 241 to 247 to read as follows:

"**(5) Pod Wireless Detection System.** Install wireless magnetic sensor embedded in the groove made in pavement by using diamond shaped drill bit. Use compressed air to remove debris from groove and add a layer of self levelling epoxy before inserting sensor. Fill the groove with epoxy sealant for use as protective seal for wireless magnetic sensors installed in HMA or concrete pavements."

END OF SECTION 623

SECTION 627 - ELECTRIC AND COMMUNICATION SYSTEMS

Make the following amendments to said Section:

627.01 Description. This work shall consist of furnishing all labor, materials and equipment to install in place and in operating condition underground structures required for the facilities of Hawaii Electric Light Company, herein referred to as HELCO, the facilities of Hawaiian Telcom herein referred to as HTCO, and the facilities of the cable television vendor herein referred to as CATV. Such works shall be performed and tested at the indicated locations in accordance with the requirements herein specified and the indicated details, or as ordered by the Engineer, and includes but is not limited to the following:

(A) Complete underground duct system including excavation, backfilling, concrete work, conduits, handholes, manholes, and transformer and switching equipment pads, to be used by the HELCO for their cables and equipment. Work shall also include securing the approval of the HELCO inspector.

(B) Complete underground duct system including excavation, backfilling, concrete work, conduits, handholes, manholes, and equipment pads to be used by the HTCO for their cables and equipment. Work shall also include securing the approval of the HTCO inspector.

(C) Complete underground duct system including excavation, backfilling, concrete work, conduits, pullboxes, handholes, and equipment pads to be used by the CATV for their cables and equipment. Work shall also include securing the approval of the CATV inspector.

(D) Coordinate work and arrange for periodic inspections by HELCO, HTCO, CATV, and Engineer.

(E) Pass test mandrel through all ducts and conduits, and make corrections as directed by the inspectors or Engineer.

(F) Provide pulling wire, No. 12 AWG galvanized steel or polypropylene cord, in all empty ducts and conduits, unless indicated otherwise. Provide duct measuring/cable pulling tape in all HTCO ducts and conduits.

(G) Immediately report and pay for damages to existing equipment.

(H) Obtain and pay for electrical permits, arrange for periodic inspection by local authorities and deliver certificate of final inspection to Engineer.

(I) Contractor shall check and test the installation for completeness and functional operation as described by the drawings and specified herein. Final test shall be in the presence of Engineer and representatives of utility companies. Contractor shall arrange and pay for all testing costs.

Incidental parts which are not shown on the plans or specified herein and which are necessary to complete the underground electric, telephone, and cable television duct systems shall be furnished and installed by the Contractor as though such parts were shown on the plans, or specified herein or in the special provisions.

All electrical equipment shall conform to the NEMA Standards, and all electrical work shall conform to ordinances of County of Hawaii; latest edition of National Electrical Code; General Order No. 10, Public Utilities Commission, State of Hawaii; and Regulations and Standard Practices of HELCO and HTCO.

Applicable rules, standards and specifications of following associations shall apply to materials and workmanship:

American National Standards Institute (ANSI)
Edison Electric Institute (EEI)
Illumination Engineer Society (IES)
National Board of Fire Underwriters (NBFU)
National Electrical Manufacturer's Association (NEMA)
National Fire Protection Association (NFPA)
Underwriters' Laboratories, Inc. (UL)

627.02 Materials. Materials shall meet the requirements specified in the following subsections of Division 700 - Materials.

Concrete Pull box	712.06 (B)
Conduits	712.27

(A) Ducts and Conduits shall conform to the requirements of Section 712.27 - Conduits. Ducts and conduits required shall be new and provided by the Contractor in accordance with the construction drawings and specifications.

(1) Polyvinyl Chloride (PVC) Schedule 40 type ducts shall be provided for the HELCO, HTCO and CATV duct systems. The fittings shall be of the same material as the conduit and duct.

(2) Conduit Riser Bends shall be polyvinyl chloride (PVC) pipes with 6-foot radius for 46 KV use and 3-foot radius for 12 KV use.

The fittings shall be of the same material as the conduit and duct.

(B) Concrete shall conform to the requirements of Section 601 - Structural Concrete, except that for concrete jackets and concrete caps, the maximum size of coarse aggregate shall be 3/4 inch in lieu of the one-inch to No. 4 specified and the slump shall be 6-inch minimum and 7-inch maximum. Concrete for manholes, handholes, and pullboxes shall be Class A. Concrete for jacketing conduits and ducts shall be Class B except that the cement content shall be 5.6 sacks per cubic yard.

(C) Concrete Bricks shall conform to Subsection 704.02 - Concrete Bricks. The use of broken bricks will not be permitted.

(D) Cement Mortar for Concrete Bricks shall conform to the requirements of Section 601 - Structural Concrete. Cement mortar shall be a one-to-three volumetric mix of portland cement and a combined fine aggregate. Combined fine aggregate shall conform to Section 703 - Aggregates.

(E) Concrete Covers, Steel Frames and Miscellaneous Metals and Appurtenances for Handholes and Manholes. Steel shapes shall conform to the applicable provisions of Section 713 - Structural Steel and Related Materials. Fabrication of steel frames shall conform to the applicable provisions of Section 501 - Steel Structures. Steel frames shall be hot-dipped galvanized after fabrication. Concrete for covers shall be Class A and shall conform to Section 601 - Structural Concrete. Cast iron frame and cover shall conform to Subsection 712.07 (A) - Frame and Covers. Utility company handholes and manhole covers shall meet the requirements of each utility company's standard.

(F) Reinforcing Steel. Reinforcing Steel for manholes, handholes and pullboxes, and concrete jackets shall conform to the requirements of Section 602 - Reinforcing Steel and each Utility company's standard.

(G) Materials will be subject to inspection at any time. Failure of the Engineer to note faulty material or workmanship during construction will not relieve the Contractor of his responsibility for removing or replacing such materials and dredging the work at his expense.

627.03 Construction.

(A) General.

(1) The Contractor shall in performing required excavation and backfill, exercise due care to avoid disturbing existing facilities. He shall remove and dispose of all demolished or excess material from

the job site.

(2) Upon completion of the work, the Contractor shall submit an "As Built' or corrected plan showing in detail thereon all construction changes.

(3) Before bidding, the Contractor shall visit project site, carefully review each section of the Specification and all Drawings of this Contract, and obtain and review the standards, specifications and drawings of the local utility companies.

The Contractor shall report any error, conflicts or omissions to the Engineer at least one week before submission of bids for interpretation or clarification. If errors or omissions are not reported, the Contractor shall provide necessary work at no cost to the State of Hawaii to properly complete intent of Specification and Plans.

(4) The Contractor shall make detailed arrangements for work by utility companies pertaining to this contract. Payment to utility companies for their work shall be by the State.

(5) Electric and telephone utility cables and equipment shall be by respective utility companies. Cable television cables and equipment shall be by the cable television vendor for the area.

(B) Existing Utilities. Existing utilities are shown on the drawings in approximate locations for the convenience of the Contractor. It is not the intention of plans to imply that all existing utilities are drawn and located, and the fact that any utility is not shown on the drawings shall not relieve the Contractor of his responsibility under this Section. It shall be the Contractor's responsibility to ascertain the location of all existing utilities which may be subject to damages by construction under this Contract. The Contractor shall:

(1) Support and protect all HELCO, CATV and/or HTCO utilities during construction,

(2) Notify HELCO, CATV and/or HTCO immediately of any damage to its system caused by construction under this Contract, and

(3) Reconstruct, at his expense, damaged portions of the utility system in accordance with the requirements and specifications of HELCO, CATV and/or HTCO.

(4) The Contractor shall be responsible for and shall pay for all

damages to existing utilities of all types.

(C) HELCO Facilities. The Contractor shall provide HELCO with 24-hour access to all existing HELCO facilities that are to remain, or, for facilities that are to be removed, until they are removed and to all new HELCO facilities after they are installed. The Contractor shall be responsible for any delays in utility company work due to his failure to provide access to utility company facilities. All existing HELCO facilities shall remain in place until proposed permanent facilities are completed and energized. Any cost for temporary relocations arising during construction shall be borne by the Contractor.

Electrical equipment or conductors, whether electrically energized or not, shall remain in place at all time during construction. Handling and moving of electrical equipment or conductors, when required by the Engineer, shall be done by HELCO. Work by the Contractor in areas with energized electrical equipment or conductors shall be performed with extreme caution to prevent accidents and to avoid disturbing or damaging this equipment or conductors or any temporary supports or protective guards that are constructed. Unless otherwise permitted by HELCO, all work by the Contractor in areas with energized equipment of conductors shall be performed in the presence of a HELCO inspector and/or standby man. The Contractor shall have the sole responsibility for maintaining safe and efficient working conditions and procedures in these areas.

Any existing or new HELCO facilities including equipment or conductors damaged by the Contractor during construction shall be replaced by HELCO at the Contractor's expense.

The Contractor shall give HELCO two weeks advance notice for any work to be done by HELCO on its facilities. Unless otherwise indicated on the drawings or otherwise directed by the Engineer, HELCO will:

(1) Remove the concrete envelope from existing underground HELCO ducts containing electrical cables.

(2) Construct temporary supports and protective barriers for bare duct and electrical cables immediately after removal of the concrete envelope is completed. Material for such supports and barriers shall be furnished by the Contractor as an incidental cost.

(3) Remove temporary supports and protective barriers constructed under item (2) above.

(D) Excavation and Backfill. All excavation and backfill for electric,

telephone and cable television underground structures and trenches shall conform to the requirements of Section 206 - Excavation and Backfill for Drainage Facilities, modified as follows:

(1) Excavation

(a) The width of trenches for concrete encased ducts shall be not less than the width of the encasement nor more than that required to properly and safely execute the work.

(b) Ducts encased in concrete jackets which are bedded in disturbed (fill) ground shall be installed in the following manner: Embankments shall be built up and thoroughly compacted to the elevation which is three feet above the top-of-jacket elevation, or to the required elevation shown on the plans, whichever is less than five times the width of the jacket. This work shall conform to the requirements of Section 203 - Excavation and Embankment. The trench to accommodate the jacket shall then be excavated through the constructed embankment.

(c) The Contractor shall not excavate for manholes, handholes and duct lines until he has the locations for these structures staked out and verified to be correct, and approved by the respective utility company inspectors.

(d) Trenches shall be excavated at least 50 feet ahead of duct placement so that any obstruction to the duct line can be avoided through gradual alignment. The profile grade may be adjusted by the Engineer to increase or decrease the excavation depth (up to 3 feet) as a result of unforeseen obstruction at no additional cost.

(e) Excavation for each handhole and manhole, plus 50 feet of trenching for all ducts connected to those structures shall be completed, and the locations and depths of the handholes and manholes shall be verified and approved by the respective utility company inspectors prior to construction or installation of the structures. All cuts in excess of depths required shall be filled with concrete, beach sand, or Type A backfill. The lateral limit for handholes and manholes shall be the vertical surfaces two feet outside the neat lines of the structures.

(f) The bottom of the trench excavation shall be flat and smooth. All trenches shall be approved by the Engineer and

the utility company inspectors before any ducts or conduits are placed or any structures and foundations are constructed.

(g) The trenches shall be widened at handholes and manholes to permit proper entry of the ducts and conduits.

(h) The Contractor shall provide all sheathing and bracing to support the sides of the excavated trench. Provision and removal of these items are incidental to the trenching work.

(2) Backfill.

(a) No backfilling shall be done until the duct and conduit installations, and the handhole and manhole placements have been verified to be correct, and approved by the respective utility company inspectors.

(b) Material for use as trench backfill for direct buried cable above select backfill shall be nonexpansive and shall conform to Subsection 627.03 (D) (2) (c) below. Backfilling and compaction shall be as specified in Section 206. Backfill material shall be beach sand, earth or earth and gravel mixture. If earth and gravel, mixture must pass 1/2 inch mesh screen and contain not more than 20 percent of rock particles by volume.

(c) Material for use as select backfill for direct buried cables shall be nonexpansive and shall conform to the requirements of Subsection 703.04 (B) - Filler.

(d) Backfilling shall be to finished grades indicated on accompanying drawings, and/or matching existing conditions. Backfill material shall be placed in maximum of 8" layers in loose thickness before compacting. Backfill shall be thoroughly compacted with hand or mechanical tampers to 95% of the ASTM D1557 maximum dry density. In no case shall tamping be accomplished by using the wheels or tracks of a vehicle.

(E) Installation of Conduits and Duct Banks. All joints shall be water tight and all ducts shall be installed to drain towards pull points unless otherwise shown on the plans.

(1) Plastic Duct Joints.

(a) Field cutting of plastic ducts shall be performed using a miter box. Burrs and sharp edges shall be removed by filing before the joint is made, chamfer the interior edge of the duct. All deleterious material shall be wiped off the joining surface of the duct and the interior of the joining coupling with a clean cloth.

(b) Cement for plastic duct joints shall be obtained from the duct manufacturer. Thinning of the cement will not be permitted. A liberal and uniform coat of cement shall be applied with a daubers ball type brush to the inside of the coupling and to the outside of the duct end. Immediately thereafter, the duct shall be slipped into the socket of the fitting with a half-twisted, and the excess cement shall be wiped off.

(c) Allow the joined members to cure for at least five minutes before disturbing or applying stress to the joint. After this initial cure, care must be exercised in handling to prevent twisting or pulling the joint. In damp weather, this interval shall be increased to allow for slower evaporation of the solvent.

(d) Another fitting or section of conduit may be added to the opposite end within 2 or 3 minutes if care is exercised in handling so that strain is not placed on the previous assembly.

(e) Any joint included in a section of conduit to be bent in the trench shall be assembled above ground and allowed to lie undisturbed for at least two hours before installation. In cases where a plastic connection is made with the union under stress due to misalignment or other factors, the union shall be staked out to relieve stress on the joint until the conduit is backfilled or encased.

(2) Plastic Duct Installation.

(a) The Contractor shall provide spacers to maintain proper separation between ducts. The bottom duct spacers shall be placed on the prepared trench bottom, the first tier of ducts placed in the grooves of the spacers, and couplings attached to the duct ends. Spacers shall be 15 inches or more away from any coupling or joint. Successive lengths of ducts shall then be placed and connected to the preceding lengths as specified above. The second tier of duct spacers

shall then be placed over the ducts previously placed and followed by installation of couplings. The operation shall be repeated for each successive tier until the top tier is set in place after which the top spacers are placed.

(b) When conduit is assembled above the ground, the spacer shall be supported in a vertical position by use of a No. 4 rebar and smooth black steel wire, No. 14 gage.

(c) Duct alignment shall be as straight as feasible. Such directional changes as are required shall be made by using field made bends or with segments using angle couplings or deflection couplings, except where otherwise indicated. The deflection angle between two adjacent lengths of duct shall not exceed five degrees, unless otherwise indicated.

Horizontal bends for HTCO and CATV conduits/ducts shall be constructed with 25-foot minimum radius curves unless indicated otherwise or approved by the respective utility company inspector. Vertical bends for HTCO and CATV] conduits/ducts shall be constructed with 20-foot minimum radius curves unless indicated otherwise or approved by the respective utility company inspector.

Spacers shall not be located at the centers of a long radius bend. On pre-fabricated bends, the spacer shall be located in the tangent, free of the coupling. On trench formed bend, the spacer shall be located midway between the tangent and center of the bend.

(d) Precaution shall be taken to prevent damage in plastic duct lines from thermal expansion and contraction. At ducts shall be cool when placed in trenches and when the concrete jacket is being poured.

(e) Ducts ending in handholes and manholes shall be terminated with junior end bells. End bells, terminators or ducts shall be flush to inside wall surfaces; duct extension into boxes is not acceptable.

The terminated ends of the conduit in an underground structure shall be free of support for a distance of at least 10 feet from the structure. The conduit shall be aligned and supported inside the structure with proper spacing and shall be cut to length after the concrete envelope has cured.

(f) The ends of the conduit shall be sealed with a plastic cap, plug, or approved substitute at the end of each day's work, when work on duct installation has to be interrupted, where ducts may be submerged in water, and in stub outs.

(3) A 4" wide metallic warning tape, orange in color with a black imprinted message "WARNING -- STOP DIGGING -- CALL HTCO, COMMUNICATIONS CABLE BURIED BELOW, FAILURE TO COMPLY COULD RESULT IN LEGAL ACTION", shall be placed 12" below the surface over the duct or concrete jacket for the entire length of duct installations. See HTCO's Standard Drawing No. I34028. Recommended tape is manufactured by Thor Enterprises, Inc., Sun Prairie, WI 53590, part numbers DTOGTE-41 (1,000 feet), and DTOGTE-46 (6,000 feet). Equivalent tapes are acceptable.

(4) The Contractor shall apply a thin coat of sealing compound on ducts and conduits at couplings and bells.

(5) Conduits stubbed for future connections shall be plugged and marked.

(6) The Contractor shall securely anchor duct banks prior to pouring concrete encasement to prevent ducts from floating.

(F) Installation of Split Ducts Encased in Concrete Jacket Split ducts with concrete jacket shall be installed around existing cables that are to remain in service, where shown on the plans.

(1) Field cutting of plastic ducts longitudinally into two equal halves shall be performed by the Contractor with the use of accepted tools and equipment.

(2) The two equal halves of plastic ducts shall be placed carefully around existing cables and sturdily placed carefully around existing cables and sturdily bound together with the wire or tape in order not to dislodge during pouring of concrete. The Contractor shall take necessary precautions not to damage the cables and shall work in an expeditious manner in order to keep uncovered cable exposed for as short a period of time as possible.

(3) Subsequent to binding of the plastic ducts, concrete shall be poured to fully encase the ducts. The dimensions of the concrete encasement shall be similar to standard duct formation encasement dimensions.

(G) The Contractor shall test the completed ducts by passing a test

mandrel through the length of each duct of each duct run. For HELCO and CATV conduits, the mandrel shall be a bullet shaped, blunt tipped type, unless indicated otherwise, about 14 inches long with a diameter 1/2 inch less than the inside diameter of the ducts through the length of each duct run. Mandrel for HTCO ducts shall be bullet shaped, blunt tipped type about 12 inches long with a diameter 1/4 inch less than the inside diameter of the ducts through the length of each duct run. Scars in the mandrel deeper than 1/32 inch, other than that caused by normal abrasion between the duct line and bottom of mandrel shall be considered an indication of the presence of burrs and/or obstructions in the duct run.

The Contractor shall remove such burrs and/or obstructions, after which the test mandrel will be passed through again. All tests shall be conducted in the presence of the Engineer and respective utility company inspectors, and shall be repeated until the results obtained are satisfactory to the Engineer and to the utility company inspectors.

(H) Unless indicated otherwise, the Contractor shall furnish and install a 1/8 inch Polyolefin pull line between pull points in all ducts after testing.

For HTCO ducts, provide duct measuring/cable pulling tape (NEPTCO WP1800P Muletape or approved equal) in each new duct. Using the duct measuring/cable pulling tape, Contractor shall measure the actual lengths for duct runs and for at least one duct of each common duct run. The distances shall be marked on the record prints and submitted to the Owner at the final inspection. A copy of the record prints shall also be submitted to the HTCO inspector for record keeping.

(I) Concrete. The Contractor shall notify the utility companies inspector a minimum of 72 hours prior to placement of any concrete.

(1) Securely anchor duct banks prior to pouring concrete encasement to prevent ducts from floating.

(2) When pouring concrete, prevent heavy masses of concrete from falling directly on ducts. If unavoidable, protect ducts with plank.

(3) Direct flow of concrete down sides of duct bank to bottom, allowing concrete to rise between ducts, filling all open spaces uniformly.

(4) To insure against voids in concrete, work a long, flat splicing bar or spatula liberally and carefully up and down the vertical rows of ducts. Mechanical vibrators shall be used for stacked duct banks of three ducts or higher.

(5) Cure concrete for a minimum of 72 hours before permitting traffic and/or backfilling.

(6) Convey concrete from mixer to forms rapidly. Free drop shall be limited to five feet, unless authorized by inspector.

(7) Placing.

(a) Clean and remove all debris from inside forms and trenches before placing concrete.

(b) Place concrete only on clean damp surfaces, free from water.

(c) Place concrete in forms, in horizontal layers not exceeding 18" thickness.

(d) Place concrete to avoid segregation of materials and displacement of ducts, inserts and reinforcing.

(e) Vibrate structural concrete thoroughly during and immediately after placing.

(8) Forming.

(a) Forms shall be of good sound lumber with sufficient strength and conforming to shapes and dimensions indicated on drawings.

(b) Forms shall be treated with non-staining form oil immediately before each use.

(9) Patching: Patch large voids, pour joints and holes before concrete is too rigid to move fluidly. Use mortar of same proportions as original concrete.

(10) Curing: Curing of concrete shall be accomplished by impervious membrane method with liquid membrane compound. Apply two or more coats to obtain a total of one gallon for each 150 square feet of concrete surface.

(J) Reinforcing Steel.

(1) Clean reinforcing of mill or rust scale and form to dimensions indicated.

(2) Install reinforcing in proper locations and secure in place to prevent movement during concrete placing or vibrating.

(K) Concrete Brick.

(1) Concrete brick shall be laid in full bed of mortar, both horizontally and vertically.

(2) Mortar shall be one part cement and three parts sand, I thoroughly mixed and used when fresh. Retampering will not be allowed.

(3) Setting bed shall be of depth required to bring top of blocks flush with finish line.

(L) Manholes, Handholes and Pullboxes.

(1) Boxes shall be installed approximately where shown. The exact location of each box shall be determined after careful consideration has been given to the location of other utilities, grades, and pavement. Boxes shall be of the type noted on the Drawings and shall be constructed in accordance with the applicable details and standard drawings as indicated.

(2) Pullboxes shall be installed on a minimum of 3" #3 crushed rock.

(3) Ducts ending in manholes and handholes shall be terminated with junior end bells. End bells, terminators or ducts shall be flush to inside wall surfaces; duct extension into boxes is not acceptable. Verify complement and arrangement of ducts entering each manhole or handhole and location of duct entrance with the respective utility company prior to fabrication of the respective manhole and handhole.

(M) Restoration of Existing Streets and Other Improvements. Street, sidewalks, curbs, gutters, traffic detection loops, and other improvements of the State, private owners, or those of the City and County which are maintained by the State, which are damaged by rearrangements to the electric, cable television or telephone system, shall be restored by the Contractor to their original condition or better. Existing concrete pavement disturbed by the Contractor shall be removed and reconstructed at the pavement scorelines or joints. Spot repairing of the concrete pavement will not be allowed. Materials and workmanship shall conform to the applicable sections in these specifications.

Repairing of existing City streets and other improvements not maintained by the State and where such work is called for on the plans, inside and outside of the right-of-way, publicly or privately owned, which are damaged by the Contractor's operations shall be restored to their original condition, or better, at his expense. Unless the County of Hawaii specifications are more stringent or not covered in the HDOT specifications, the materials and workmanship shall conform to the "HDOT Standard Specifications".

All disturbed unpaved surfaces shall be backfilled and graded to match the surrounding areas, and sodded areas shall be replanted with the same type of grass. Fences and other improvements shall be restored to their original condition.

627.04 Measurement. The Engineer will measure electric and communication systems, if ordered by the Engineer, on a force account basis, in accordance with Subsection 109.06 – Force Account Provisions and Compensation.

627.05 Payment. The Engineer will pay for the accepted electric and communication systems on a force account basis. Payment will be full compensation for the work prescribed in this section and the contract documents.

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

Pay Item	Pay Unit
CATV Utilities	Force Account
HELCO Utilities	Force Account
HTCO Utilities	Force Account

The Engineer will not pay for trench excavation and backfill, sawcutting and repairing of existing pavement or other improvements, and conduit risers. The Engineer will consider the cost for these items as included in the contract prices of the various contract items.

The Engineer will not pay for additional materials and labor not specifically shown or called for in the contract documents but are necessary to complete the work.

An estimated amount for the force account may be allocated in the

proposal schedule under CATV Utilities, HELCO Utilities, or HTCO Utilities, but 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."

END OF SECTION 627

SECTION 632 – MARKERS

Make the following amendment to said Section:

(I) Amend **Section 632.04 - Measurement** by replacing lines 79 to 81 to read:

"**632.04 Measurement.** The Engineer will measure reflector marker, milepost marker with post (bi-directional), milepost marker, and Type II object marker per each as complete units of the type and design specified in the proposal."

(II) Amend **Section 632.05 – Payment** by replacing lines 83 to 100 to read:

"**632.05 Payment.** The Engineer will pay for reflector marker, milepost marker with post (bi-directional), milepost marker, and Type II object marker at the contract price per each for the type and design specified complete in place. Payment will be full compensation for excavating and backfilling, furnishing and installing materials, furnishing equipment, tools, labors and incidentals necessary to complete the work.

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

Pay Item	**Pay Unit**
Type II Object Marker	Each"

END OF SECTION 632

Make the following section a part of the Standard Specifications:

SECTION 636 – BOLT DOWN CURBING WITH DELINEATORS

636.01 Description. This section describes furnishing and installing bolt down curbing with delineators shown in the plans according to the requirements of the contract or as ordered by the Engineer.

636.02 Materials. The bolt down curbing with delineators system shall consist of a prequalified product such as Tuff Curb or approved equal.

System shall be of uniform composition, free from surface irregularities, and free from other physical damage or defects that affect appearance or performance, or both.

636.03 Construction. Contractor shall furnish and install bolt down curbing with delineators system per manufacturer's specifications at locations identified on plans.

(A) General.

(1) Remove surface moisture and other materials that may adversely affect system installation.

(2) Establish control points and layout alignment for bolt down curbing system.

(3) Curb sections spacing should be ½" but no more than 1" to allow for drainage.

(4) Bolt down curbing should begin and end with corresponding end sections per manufacturer's specifications.

636.04 Measurement. The Engineer will measure bolt down curbing with delineators system per linear foot in accordance with the contract documents.

636.05 Payment.

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

Pay Item	Pay Unit
Bolt Down Curbing with Delineators	Linear Foot

END OF SECTION 636

SECTION 750 – TRAFFIC CONTROL SIGN AND MARKER MATERIALS

Make the following amendments to said Section:

(I) Amend **Subsection 750.01(A)(1) Retroreflectorization** by replacing lines 8 through 31 to read:

"**(1) Retroreflectorization.** The following shall be retroreflectorized:

(a) Background for illuminated guide signs and exit number panels ("E" designation) with ASTM D 4956 Type XI retroreflective sheeting.

(b) Background for non-illuminated guide signs and exit number panels ("D" designation) with ASTM D 4956 Type XI retroreflective sheeting.

(c) Messages, arrows, and borders of guide signs and exit number panels ("D" and "E" designations) with ASTM D 4956 Type XI retroreflective sheeting.

(d) Regulatory and warning signs, directional signs ("DIR" designation), route and auxiliary markers, shield symbols, yellow "EXIT ONLY" panels, construction warning signs, and barricade rails, completely, with Type III, IV, or IX retroreflective sheeting.

(e) Pedestrian, school, bicycle crossing series, completely with Type IX fluorescent yellow green retroreflective sheeting."

(II) Amend **Subsection 750.01(B) Backing** by replacing lines 72 through 73 to read:

"Aluminum sheet shall conform to ASTM B 209, alloy 5052-H38 or 6061-T6 flat sheet."

(III) Amend **Subsection 750.01(E) Retroreflective Sheeting Materials** by replacing lines 1126 through 1137 to read:

"**(E) Retroreflective Sheeting Materials.** Retroreflective sheeting includes white or colored sheeting having smooth outer surface.

Retroreflective sheeting shall be classified in accordance with ASTM D 4956.

The coefficient of retroflection shall meet the minimum requirements of ASTM D 4956 for the type of reflective sheeting specified.

The color shall conform to the latest appropriate standard color tolerance chart issued by the U.S. Department of Transportation, Federal Highway Administration and to the daytime and nighttime color requirements of ASTM D 4956.

Test methods and procedures shall be in accordance with ASTM.

(IV) Amend **Subsection 750.02(C) Square Tube Posts** by replacing lines 1168 through 1172 to read:

"**(C) Square Tube Posts.** Square and other tube posts shall conform to ASTM A 653 for cold-rolled, carbon steel sheet, commercial quality; or ASTM A 787 for electric-resistance-welded, metallic-coated carbon steel mechanical tubing."

END OF SECTION 750

SECTION 755 – PAVEMENT MARKING MATERIALS

Make the following amendments to said Section:

(I) Amend **Subsection 755.02 (C) Retroreflective Pavement Markers** by revising lines 223 to 236 to read:

"Exterior surface of shell shall be smooth and contain one or two retroreflective faces of specified color."

(II) Amend **Subsection 755.05 (C)(1) Glass Beads** by adding the following after line 869:

> "**(f)** The glass spheres shall not contain more than 200 ppm (total) arsenic, 200 ppm (total) antimony nor more than 200 ppm (total) lead, when tested according to EPA Methods 3052 and 6010C. Other suitable x-ray fluorescence spectrometry analysis methods may be used to screen samples of glass spheres for arsenic and lead content."

END OF SECTION 755

SECTION 770 – TRAFFIC SIGNAL MATERIALS

Make the following amendment to said Section:

(I) Amend **770.01 Traffic Signal Standards** to read as follows:

"770.01 Temporary Traffic Signal Poles (Wood).

(A) Temporary Traffic Signal Poles are wood poles. Wood poles shall be of Douglas Fir. Wood poles shall have a minimum diameter of 12 inches at grade. Wood poles shall have less than 180 degrees twist in grain over full length, and sweep shall be less than 4 inches. Tops of the wood pole shall be beveled. After fabrication, wood poles shall be pressure treated in accordance with AWPA Use Category System UC4B, Commodity Specification D. See traffic signal plans for more details.

(B) **Standard Specifications.** Design of temporary traffic signal poles (wood) and appurtenances shall conform to AASHTO publication, Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals.

(C) **Certification and Mill Test Reports.** Certification and mill test reports shall be submitted with the following information:

(1) List of component parts including the following:

(a) Description of each part.

(b) Materials manufacturing location (including ASTM number where applicable).

(c) Certificate of compliance.

(2) Shop drawings accompanied by complete and detailed engineering computations that justify the selection of dimensions and material. Hawaii Licensed Professional Engineer (Structural) shall certify the computations.

(3) Copy of the mill test report for structural members (posts and beams), including physical and chemical description of material incorporated."

(III) Amend **770.05 Controller Equipment** to read as follows:

"770.05 Controller Equipment

(A) Controller Assembly. Controller Assembly shall include Model 170ATC controller, cabinet, and auxiliary equipment. Unless otherwise indicated in the contract documents.

Testing and quality control requirements shall be as specified in Subsection 623.03(G)(2)(a).

Controller assemblies are described and shall be supplied as follows:

(1) Model 170ATC controller assembly and Model 332A controller cabinet refers to latest Model 170ATC controller assembly and Model 332A controller cabinet. A pre-approved equal or better (approval must be obtained before bid opening).

(2) Each controller assembly listed in Table 770.05- 1 - Controller Assembly Requirements contains sufficient equipment for full 8-vehicle, 4-pedestrian, and 4-preemption phase intersection, even though the contract documents may not require it.

TABLE 770.05-1 - CONTROLLER ASSEMBLY REQUIREMENTS

Item	Quantity
Model 170ATC controller	1
Model 412D prom module	1
Model 400 modem	1
332A aluminum cabinet	1
Model 200 load switches	12
Model 204 flasher	All
Model 242 isolators	4
Model FS/ST isolator	All
Flash transfer relays	All
Model 210 conflict monitor	1
Model 762 preempt. card with 758 AIP	2
GPD Time Source Module	1

(B) Model 170ATC Controller. Model 170ATC controller shall meet the following additional requirements:

(1) Model 412D PROM module, shall include 27256 EPROM chip.

(2) Supercap shall replace battery as standby power supply to keep detector amplifier (DTA) and RAM on CPU board powered for atleast eight hours during AC power loss.

(3) Controller boards shall be mounted vertically.

(4) One installation manual shall be submitted with each controller.

(5) Documented validation testing shall be performed in accordance with CALTRANS test specifications.

(6) Display panel shall be menu-driven.

(C) Cabinet. Each 332A Cabinet shall meet the following additional requirements:

(1) Cabinets shall be wired for minimum eight vehicle phases, four pedestrian phases, and four preemption phases.

(2) Cabinets shall be fabricated from .125-inch-thick anodized aluminum with anti-graffiti coating.

(3) Cabinet's main breakers shall be rated at 50 amps.

(4) Entire output file copper hard-wire of sufficient gauge to withstand current surges before circuit breakers or surge protectors trip.

(5) LED display for modem transmit, receive, and carrier-detect status shall be clearly visible after opening cabinet's front door. Indicators mounted on 0.75-inch by 2-inch aluminum assembly shall be attached to top center of cabinet's rack. Indicators shall derive signals from C2 ACIA. Wires shall be bundled with protective jacket.

(6) C2 terminal blocks shall be protected from current surges by EDCO PC642 or equal.

(7) Input File and Field Terminal blocks wired for 3M 762 Opticom Priority Module EVA, EVB, EVC and EVD.

(8) Power supply surge protector shall be furnished.

(9) Front and back fluorescent lights activated upon opening any door.

(10) Convenience ground-fault circuit interrupter (GFCI) receptacles shall be provided.

(11) Door Locks of solid brass rim Best Lock Series 516RL3XA7559-606 and include 2 keys.

(12) Labelling by Silk Screening only.

(13) Output File Terminal Blocks labeled in reference to its assigned phase and signal indications.

(14) One each 24-inch by 36-inch cabinet print shall be attached in a weatherproof plastic jacket to front and back cabinet doors.

(15) Documented validation testing of cabinet and conflict monitor according to CALTRANS test specifications.

(D) **Auxiliary Equipment.** Controller unit shall be delivered with the following auxiliary equipment:

(1) Model M762 Optical Preemption Module. The M762 will be card type and will interface with the Model 170ATC controller cabinet preemption slots of the input file. Each M762 Model will have two channels of preemption. M752 shall include firmware to discriminate between two valid priority signals, to prioritize valid same priority signal on a first come, first served basis, and to override low priority signal if high priority is received. M762 Module will receive input signals (9.639 and 14.035 Hz) to permit priority preemption operation within the local intersection program compatible with Model 170ATC controller. M762 shall optically isolate outputs signals and shall trigger active low signal to controller for high priority and pulsed active low signal for low priority. The State's preemption systems employ the 3M Opticom System. New preemption equipment shall be 3M Opticom or accepted equal that is fully compatible with 3M Opticom.

(2) GPS Time Source Module. GPS Time Source Module shall be a stand-alone precision clock, located in controller cabinet. GPS Time Source Module shall be used to update internal clock of Model 170ATC controller by decoding five broadcast frequencies (2.5, 5, 10, 15, 20 MHz) transmitted

by WWVH (radio station) of the U.S. National Institute Standards and Technology. Hardware and software of GPS Time Source Module equipment shall be compatible without modification to Model 170ATC hardware or software. GPS Time Source Module shall meet the following specifications:

(a) 1.5 ms time accuracy.

(b) 2 to 4 minutes time to acquire.

(c) Minimum 5 Frequency, AM, crystal-controlled, dual conversion, super heterodyne receiver, automatic scan 5 frequencies.

(d) Data output RS-232C, 1200 and 2400 baud rate, no parity, 8 data bits, 1 stop bit.

(e) One-hour selectable time zones and daylight saving time option.

(f) 24-hour time format.

(g) Month, day, and year date.

(h) DB25-RS232 and BNC antenna connector.

(i) DB25 to Model 170ATC C2 cable and connectors

(j) 2-foot outdoor whip antenna with pole adapter bracket.

(k) Approximate size: 1-1/2-inch high x 8-inch wide x 9-inch deep; and weight 1-1/2 pounds.

(l) 24 VDC.

(m) McCain GPS Standalone Modules with antenna /equivalent or better."

(IV) Add **Subsection 770.12 Uninterruptible Power Supply (UPS)** to read as follows:

"770.12 Uninterruptible Power Supply (UPS)

The Uninterruptible Power Supply (UPS) shall provide uninterruptible reliable emergency power to a traffic intersection in the event of a power failure or interruption.

The uninterruptible power supply (UPS) shall provide battery power to traffic intersections for a period of time as designated by the agency. The transfer from utility power to battery power will not interfere with the normal operations of the traffic controller, conflict monitor or any other peripheral devices within the traffic control system. The UPS / UPS system shall be comprised as noted below and shall include, but not be limited to: line-interactive type/charger (UPS), power transfer switch (PTS), batteries, a separate manually operated, non-electronic by pass switch (MBPS), all necessary hardware and interconnect wiring.

The system shall be capable of providing power for full run-time operation, flashing mode operation, or a combination of both full and flash mode operation of an intersection. The operation of the flash mode shall be field programmable to activate at various times, battery capacities, or alarm conditions locally using the touch pad or remotely using an industry standard PC's RS232, USB interface and Ethernet port shall be located on the front panel of the UPS. Interface cables shall be pinned for industry standard configuration, no proprietary cable pin out allowed.

The system shall be designated for outdoor applications and meet the environmental requirements as detailed herein.

(A) **System Capacity and Runtimes.** The UPS shall be configured such that it provides a minimum of two (2) hours of full runtime operation for an intersection using LED and/or incandescent traffic and pedestrian signals. The UPS shall be 2000 VA / 1500 Watts with 80% minimum inverter efficiency. The actual load at any given intersection will determine battery sizing.

(B) **Relay Contacts**. The UPS shall provide the user with 6 sets of fully programmable, relay contacts of type N/O, N/C, panel-mounted, potential free and rated 1 Amp, 120 VAC and labeled C1 through C6. Each relay's setting shall be programmable to activate under any number of conditions locally using the touch pad or remotely using RS232, USB or Ethernet interfaces. The available settings for the relays are outlined below.

Relay contacts C1 through C6 can be independently configured to activate under any of the following conditions:

(1) ON BATTERY relay activates when UPS switches to battery power.

(2) LOW BATTERY relay activates when batteries have reached a certain level of remaining useful capacity while on battery power. This number is adjustable from 0 to 100%.

(3) TIMER relay activates after being on battery power for a given amount of time. This number is adjustable from 0 to 8 hours.

(4) ALARM relay activates after a specific or general alarm is detected. These alarm conditions include line frequency, low output voltage, no temperature probe, overload, batteries not connected, high temperature, and low temperature. The relay can be programmed to activate when any of these alarm conditions are met, or when a specific condition is met.

(5) FAULT relay activates after a specific or general fault is detected. These fault conditions include: short circuit, low battery voltage, high battery voltage, high internal temperature, and excessive overload. The relay can be programmed to activate when any of these fault conditions is met, or when a specific condition is met.

(6) OFF relay is disabled and will not activate under any condition.

(C) Default Relay Settings

(1) Relay C1 and C2 shall be set to activate whenever the UPS transfers to battery power and shall be labeled "ON BATT".

(2) Relays C3 and C4 shall be set to activate whenever the batteries reach 40% of remaining useful capacity and shall be labeled "LOW BATT".

(3) Relays C5 and C6 shall be set to activate whenever the UPS has been on battery power for 2 hours and shall be labelled "TIMER".

(4) Terminal block position 19 & 20 shall be set to activate a self-test. This test confirms that a unit can transfer into and out of battery mode while supporting the output load.

(D) Operation

(1) The Manual By Pass Switch (MBPS) shall be rated at 240VAC, 40 Amps minimum.

(2) The MBPS shall allow replacement of the UPS without having to interrupt power to the intersection. The MBPS and power transfer switch (PTS) shall be separate units allowing for the replacement of the UPS or PTS without interrupting power to the intersection.

(3) The UPS shall use a temperature compensated battery charging system. The charging system compensate over a wide range of 2.5 to 4 mV / $^{\circ}C$ / Cell. The charger shall be rated 10 Amps at 48VDC.

(4) The temperature sensor shall be external to the UPS unit. The temperature sensor shall be supplied with 3 meters (9' 10") of wire.

(5) Batteries shall not be charged when battery temperature exceeds $50^{\circ}C \pm 3^{\circ}C$.

(6) The UPS shall be automatically monitor on an ongoing basis that battery power is present and available in the event it is needed during a utility outage. A "Battery Not Connected" alarm shall be issued if battery power is not present.

(7) When utilizing battery power, the UPS output voltage shall be between 110VAC and 125VAC, pure sine wave output with THD < 3% at 60 Hz +/- 3 Hz.

(8) In the vent of UPS failure, battery failure or complete battery discharge, the power transfer switch (PTS) shall revert to the utility or line mode (in a de-energized state) where utility power is supplying the cabinet.

(E) Environmental. The operating temperature for both the inverter/charger (UPS), power transfer switch (PTS) and manual by pass switch (MBPS) shall be $-37^{\circ}C \; to + 74^{\circ}C$.

(F) Product Compatibility

(1) UPS shall be compatible with all of the following for full phase, flash operation mode or a combination of both full and flash mode operation:

- Type 332 cabinets
- Model 170ATC Controller / equivalent, or better controllers
- Electrical service pedestals

(2) Complete UPS system including batteries shall fit inside a Type 336 Full Height cabinet.

(3) UPS system shall be on the Caltrans Acceptable Brands List (ABL) for Battery Backup Systems.

(G) Loss / Restoration of Utility Power

(1) In the event the UPS senses the utility line voltage is outside the Hi and Low Limits (100 & 130VAC respectively set as default), the UPS shall transfer the load to battery power.

(2) The UPS shall return to line mode when utility power has been restored to above 105VAC for more than 30 seconds. This line qualification time can be adjusted to 3, 10 or 30 seconds locally using the touch pad or remotely using the RS232 and USB interfaces.

(3) The UPS shall return to line mode when the utility power has been restored to below 125VAC for more than 30 seconds. Or, the UPS shall return to line mode when the utility power is back to nominal. This line qualification time can be adjusted to 3, 10 or 30 seconds locally using the touch pad or remotely using the RS232, USB and Ethernet interface.

(4) The maximum transfer time allowed, from disruption of normal utility line voltage to stabilized inverter line voltage from batteries, shall be 65 milliseconds. The same maximum allowable transfer time shall also apply when switching from inverter line voltage to utility line voltage.

(H) Back-Feed and Other Protections

(1) The UPS shall be equipped to prevent a malfunction feedback to the cabinet or from feeding back to the utility service per UL 1778, Section 48 "Back-Feed Protection Test". The back-feed voltage from the UPS system shall be less than 1 Volts AC for the protection of the traffic engineer or a technician.

(2) The UPS shall have lighting surge protection compliant with IEEE/ANSI C.62.41 for 2000 Volts AC.

(I) Mounting / Configuration

(1) Mounting method shall be shelf-mount, rack-mount, sliding shelf, swing-tray mount or combination thereof. UPS and PTS units individually shall not exceed 5.25" or 3U in height.

(2) All necessary hardware for mounting (shelf angles, rack, shelving, harness, etc.) shall be included in the bid price of the UPS. If swing-trays are used, a minimum of 6 bolts/fasteners shall be used to secure it to the

19" cabinet rack. For sliding shelves, shelf locking latches shall be used to prevent the shelf from accidental slide out.

(3) External battery cabinets may be used to meet adequate environmental and physical requirements.

(4) Cabinet shall be of Type "336 Full Height" (integral extension base). Finish shall be of anti-graffiti type over a power coated, powder ASA-70 light gray color coating.

(5) Cabinet locks shall be of type Best K key locks with "construction core".

(J) Functionality, Displays, Controls, Diagnostics and Maintenance

(1) The UPS shall include a LCD display to indicate current battery charge status, various input/output voltages, power output, battery temperature, date, time and settings of the various field programmable relays. The same parameters shall be available via RS232, USB and Ethernet interfaces for remote monitoring.

(2) The UPS shall provide the power beyond the temperature that would be field programmable for an external fan located in the same or in a separate battery cabinet. The temperature setting shall be adjustable from the touch pad or remotely via RS232, USB or Ethernet ports. The temperature range shall be from +20 $^{\circ}C$ *to* $+ 55\ ^{\circ}C$ in 1 degree C increment.

(3) All control, programming, maintenance and inquiry shall be accessible via the keyboard on the face of the UPS without the need for the use of any additional equipment or external PC.

(4) The UPS shall be capable of accepting firmware updates of the non-volatile, read-only memory via serial port communications. The updates shall be accomplished by uploading the software to the UPS over the RS232/USB serial/Ethernet ports located on the face of the UPS.

(5) The UPS shall be provided with a re-settable inverter event counter and a cumulative inverter timer that is accessible via the LCD screen or remotely via RS232, USB and Ethernet ports.

(6) The UPS shall be equipped with an event log that stores for a minimum the last 100 events. The events shall be time and date stamped. The event log shall be retrievable via RS232, USB or Ethernet and from the

UPS LCD screen. The event log shall display and print out in plain English when output over the RS232, USB and the Ethernet ports.

(7) The UPS shall be capable of performing a SELF-TEST, locally from the UPS front panel LCD, or remotely via RS232, USB and Ethernet interfaces. The duration of the SELF-TEST shall be programmable in 1-minute increments from 1 min. to 255 minutes.

(8) The level for LOW BATTERY ALARM shall be available on the RS232, USB and Ethernet connector located on the front face of the UPS. The programmable LOW BATTERY alarm contact shall be available on RS232, USB and Ethernet interfaces for local or remote access with the incremental adjustment of 0.25VDC.

(9) Certain maintenance controls such as Battery Test, UPS inverter ON/OFF viewing the Event log and changing default settings shall be password protected. The user can change the password in order to restrict access to sensitive functions.

(10) The following LED lights condition shall be used to indicate current status:

Green LED Flashing	for battery back-up mode
Green LED Steady ON	for normal line mode operation
Red LED Flashing for	ALARM conditions
Red LED Steady ON for	FAULT conditions

(11) UPS shall be easily replaced and installed (complete turnkey system with all necessary hardware). UPS shall not require any special tools for installation.

(K) Battery System

(1) Individual batteries shall be 12VDC type and shall be easily replaced and commercially available off the shelf.

(2) The battery system used in the UPS shall consist of 4 batteries and for safety, shall be of a voltage not to exceed 60VDC. Batteries shall be provided with quick disconnect terminals and a polarized – keyed battery cable for easy field installation. Battery sizing will be determined by the load and runtime requirements for any given intersection.

(3) Batteries shall be able to withstand extreme temperature, deep cycle, sealed prismatic lead calcium based AGM/VRLA (Absorbed Glass Mat/Valve Regulated Lead Acid) batteries.

(4) Batteries shall be certified to operate over a temperature range - $20^{\circ}C \; to + 74^{\circ}C$

(5) The batteries shall be provided with appropriate interconnect wiring and a corrosion-resistant stationary or swing-out mounting tray and /or brackets appropriate for the cabinet into which they will be installed.

(6) Batteries shall indicate maximum recharge data and recharging cycles.

(7) Recharge time for the battery from protective low cutoff to 80% or more of full battery charge capacity, shall not exceed twenty (20) hours.

(8) The UPS cabinet shall be vented through the use of louvered vents, filter, and one thermostatically controlled fan operated from the UPS. The fan will automatically turn ON at the temperature programmed into the UPS.

(L) Service and Warranty. Manufacturer shall provide a two (2) year factory-repair warranty on the UPS in addition to the requirements in Subsection 108.17 Guarantee of Work.

(M) Specifications.

(1) Input Specifications

Nominal Input Voltage	120VAC, Single Phase
Input Voltage Range	120VAC +/- 25%
Input Frequency	60 Hz +/- 5%

(2) Output Specifications

Nominal Output Voltage	120VAC, Single Phase
Power Rating	2000VA (1500 Watts)
Output Frequency	60 Hz (+/- 5%)
Voltage Wave Form	Sine Wave, THD < 3%
Efficiency (nominal)	95-97%

(3) Mechanical Size

Inverter / Charger	17" wide x 5.25" high (3U) x 10" deep
PTS Assembly	17" wide x 5.25" high (3U) x 7" deep
Weight	Under 50 Lbs

(N) Equivalency Reference. The system shall be Myers Power Model MP2000TM Type "336 Full Height" (integral extension base) or better as manufactured by Myers Power Products, Inc. located at 725 E. Harrison Street, Corona, A., 92879 (951-520-1900)."

(V) Add **Subsection 770.13 CCTV Camera Assembly** to read as follows:

"770.13 CCTV Camera Assembly

(A) Description.

The camera assemblies shall be an integrated camera unit consisting of a receiver, pan & tilt, housing, lens wiper, and cables built as a single assembly having 360 degrees of continuous pan rotation, 480 TVL, and 20X zoom. A heavy-duty mount for the pole cantilever attachment shall be included with the assembly. Camera assembly shall be furnished with components assembled, complete, and a ready-to-install system.

(1) General Features:

(a) Construction
- Integrated receiver, pan and tilt, and housing without exposed cables
- Die-cast extruded Aluminum
- Stainless steel hardware

(b) Finish
- Gray polyester powder coat

(c) Viewing window
- 0.18 inch thick, optically clear impact-resistant coated lexan

(d) Operating temperature
- –40 to 122 degrees F for sustained operation

(2) Mechanical:

(a) Pan movement
- 360 degrees continuous pan rotation

(b) Vertical tilt

- Unobstructed +40 to –90 degrees

(c) Variable pan/tilt speed

- Pan 0.5 to 40 degrees/sec variable speed operation, 100 degrees/sec turbo
- Tilt 0.5 to 20 degrees/sec variable-speed operation

(3) Electrical:

(a) Input voltage of 120 VAC, 50/60 Hz
(b) Power consumption of maximum 50 VA per system
(c) Camera and lens voltage of 24 VAC
(d) Electrical connections for two power source connections made at mount location with wire nut splices and one ground terminal; one BNC receptacle and four terminal on interconnect PCB at mount location

(4) Certifications/Ratings

(a) CD, Class B
(b) UL listed to Standard 2044
(c) FCC, Class B
(d) NEMA 4X
(e) IP66

(5) Enclosure

(a) Aluminum
(b) Dust-tight
(c) Waterproof
(d) Pressurized
(e) Sun shroud

(6) Camera

(a) NTSC high resolution color
(b) Image device: 1/3 inch CCD
(c) Picture element: 768(H) x 494(V)
(d) Scanning system: 525 lines; 2:1 interface
(e) Sync system: AC line lock/internal
(f) Horizontal resolution: 480 TVL
(g) Minimum illumination: 0.9 lux at 30 IRE, f1.2
(h) CCD iris: 1/60 to 1/100,000 sec

(i) CCD iris control: on/off selectable
(j) Signal-to-noise ratio: 52 dB (AGC off)
(k) Automatic gain control: on/off selectable
(l) Phase control: V-phase control (120 degrees)
(m) Backlight compensation: on/off selectable
(n) Video out: 1 Vp-p, 75 ohms, sync negative, BNC type
(o) Power consumption: 5W

(7) Lens

(a) Type: motorized zoom
(b) Format size: 1/3 inch
(c) Focal length: 5.6 – 112 mm
(d) Zoom ratio: 20X
(e) Relative aperture: 1.6-360
(f) Operation, Iris: auto iris, Focus and zoom: motorized
(g) Minimal object distance: 1.5m
(h) Provide lens wiper

(8) Controls

(a) Shall be controllable or interoperable by a video-to-digital converter and control.
(b) If necessary translator boards to convert the camera commands will be installed only in the camera assembly.
(c) Integrated window wiper with programmable delay and shut-Off

(9) Mount

(a) Outdoor type
(b) Aluminum or stainless steel components
(c) Mounts cantilever style on pole shafts using straps
(d) Constructed of marine grade stainless steel
(e) Has cable feed-through
(f) Supports up to 100 lbs
(g) Painted White
(h) Wall to pole mount adapter

EQUIVALENCY REFERENCE:

Pelco Esprit PTZ Color Camera, Model ES31PCBW24-N, 120VAC, 24x zoom, pedestal adapter and pedestal pole mounting bracket

(B) Incidentals.

Furnish and install all necessary cables and hardware for power, control data, and video. Local CCTV Power requires Type TC, 3#1 2XHHW, 60OV, PE jacket; Control requires 2 pair, 22AWG, stranded, shielded outdoor PE jacket; Video requires RG59/U outdoor, 20 solid AWG; with required coaxial-cable inline electrical protection and isolation device.

(C) Network and Video Server.

Shall consist of a standalone four-channel analog-to-digital video encoder with IP addressing. It shall support all types of analog cameras including PTZ (pan/tilt/zoom) and PTZ domes. The encoder shall have both RS-422 and RS-485 for controlling analog PTZ cameras.

(1) Video compression

(a) Motion JPEG
(b) MPEG-4 Part 2 (ISO/IEC 14496-2), Profiles: ASP and SP

(2) Resolutions

(a) Resolutions 4CIF, 2CIFExp, 2CIF, CIF, QCIFmax 704x480 (NTSC) 768x576 (PAL)min 160x120 (NTSC) 176x144 (PAL)

(3) Frame rate(NTSC/PAL)

(a) Motion JPEG: Up to 30/25 fps at 4CIF (1 channel)
(b) 30/25 fps at CIF (4 channel)
(c) MPEG-4: Up to 30/25 fps at 2CIF (1 channel)
(d) 21/17 fps at 4CIF (1 channel)
(e) 20/17 fps at CIF (4 channel)

(4) Video streaming

(a) Simultaneous Motion JPEG and MPEG-4
(b) Controllable frame rate and bandwidth
(c) Constant and variable bit rate (MPEG-4)

(5) Image settings

(a) Compression levels: 11 (Motion JPEG) /23 (MPEG-4)
(b) Rotation: 90°, 180°, 270°
(c) Aspect ratio correction

(d) Color: color, black & white
(e) Overlay capabilities: time, date, text or image
(f) De-interlace filter

(6) Audio(AXIS 241QA/SA)

(a) G.711 PCM 64kbit/s, G.726 ADPCM 32 or 24 kbit/s, full duplex, half duplex, simplex or audio off

(7) Security

(1) Multiple user access levels with password protection, IP address filtering and HTTPS encryption

(8) Alarm and event management

(a) Events triggered by built-in motion detection, external inputs or according to a schedule
(b) Image upload over FTP, email and HTTP
(c) Notification over TCP, email, HTTP and external outputs
(d) Pre- and post-alarm buffer of 9 MB per channel (approx. 4 min of CIF resolution video at 4 frames per second)

(9) Pan/Tilt/Zoom

(a) A wide range of analog PTZ dome cameras is supported, free drivers available at www.axis.com
(b) 20 presets/camera, Guard tour, PTZ control queue

(10) Connectors

(a) Analog composite video, NTSC/PAL autosensing inputs:
(b) AXIS 241Q/QA: 4 BNC inputs
(c) AXIS 241S/SA: 1 BNC input and 1 BNC output: loopthrough or Y/C video input
(d) Ethernet 10BaseT/100BaseTX, RJ-45
(e) Terminal block: 4 alarm inputs, 4 alarm outputs, RS-485/422 half duplex port, alternative power connection
(f) D-Sub for RS-232 port

(g) AXIS 241QA/SA: 3.5 mm jack for Mic in (max 54 mVpp) or Line in (max 8.0 Vpp, mono), 3.5 mm jack for Line out (max 2.6 Vpp, mono) to active speaker

(11) Casing

(a) Metal casing. Standalone, stackable

(12) Processors and memory

(a) CPU: ETRAX 100LX 32bit
(b) Video processing and compression: ARTPEC-2
(c) RAM: 64MB (241Q/QA), 32 MB (241S/SA)
(d) Flash: 8 MB
(e) Battery backed up by real-time clock

(13) Power

(a) 7 - 20 V DC, max 8 W

(14) Operating conditions

(a) 5 - 50 °C (41 - 122 °F)
(b) Humidity 20 - 80% RH (non-condensing)

(15) Installation, management and maintenance

(a) Installation tool on CD and web-based configuration
(b) Configuration backup and restore
(c) Firmware upgrades over HTTP or FTP

(16) Video access from Web browser

(a) Camera live view, sequence tour capability for up to 20 PTZ presets or other Axis video sources, customizable HTML pages

(17) Minimum Web browsing requirements

(a) Pentium III CPU 500 MHz or higher, or equivalent AMD
(b) 128 MB RAM
(c) AGP graphic card, Direct Draw, 32 MB RAM
(d) Windows XP, 2000, NT4.0*, ME* or 98*, DirectX 9.0 or later

(e) Internet Explorer 5.x or later

(18) System integration support

(a) Powerful API for software integration available at www.axis.com, including AXIS VAPIX API, AXIS Media Control SDK, event trigger data in video stream, embedded scripting and access to serial port peripherals over HTTP/TCP
(b) Watchdog secures continuous operation, can be monitored by other systems via event notification
(c) Embedded operating system: Linux 2.4

(19) Supported protocols

(a) HTTP, HTTPS, SSL/TLS*, TCP, SNMPv1/v2cv/v3 (MIB-II), RTSP, RTP, UDP, IGMP, RTCP, SMTP, FTP, DHCP, UPnP, ARP, DNS, DynDNS, SOCKS.
*This product includes software developed by the Open SSL Project for use in the Open SSL Toolkit.

(20) Applications (not included)

(a) AXIS Camera Station - Surveillance application for viewing, recording and archiving up to 25 cameras
(b) AXIS Camera Management – Video installation and management tool
(c) AXIS Camera Explorer – Basic software for viewing and manual recording
(d) See www.axis.com/partner/adp_partners.htm for more software applications via partners

(21) Included Accessories

(a) Power supply 9 V DC, mounting brackets, connector kit, Installation Guide, CD with installation tool, software and User's Manual.
(b) MPEG-4 decoder (Windows), MPEG-4 licenses (1 encoder, 1 decoder)

(22) Accessories (not included)

(a) Cable adapter Y/C to BNC (AXIS 241SA/AXIS 241S)
(b) AXIS 292 Network Video Decoder
(c) AXIS MPEG-4 Decoder 10 user license pack

(d) Power over Ethernet splitters and midspans
(e) IEEE 802.11g wireless bridge and access point

(23) Approvals

(a) EMC: EN55024: 1998+A1, EN55022:1998 ClassB
(b) EN61000-3-2:2000, EN61000-3-3:1995+A1.
(c) FCC Part 15 Subpart B Class B, VCCI: 2003 Class B ITE,
(d) C-tick AS/NZS 3548 and ICES-003 Class B by compliance with EN 550022:1998 Class B
(e) Safety: UL and CSA (Power supply), EN60950

(24) Dimensions (HxWxD) and weight

(a) 42 x 140 x 155 mm (1.7" x 5.5" x 6.1")
(b) 540 g (1.2 lbs) excl. power supply

(25) EQUIVALENCY REFERENCE:

(a) AXIS 241Q Networked video server with four video channels or most current equivalent /better than model
(b) Axis Communications
(c) cctv.axis.com or www.axis.com"

(VI) Add **Subsection 770.14 Wireless Detection System** to read as follows:

"770.14 Pod Wireless Detection System

Pod Wireless Detection System, a wireless magnetic sensor embedded in the road to accurately measure vehicle occupancy and detection. Pod Wireless Detection System shall include Pod, Access Point, and Base Station. Pod Wireless Detection System shall be Trafficware Pod Detection System, pre-approved equivalent or better (approval must be obtained before bid opening).

(A) **Pod.** Pods shall be located in the roadway as shown in the traffic signal plans. All the pods shall be aligned in straight line, centered in lane. Pods shall wirelessly transmit vehicle data and receive administrative data.
(1) Specifications:

(a)	Compact and robust:	2-inch H x 3.6-inch D
(b)	Frequency Band:	902 to 928 MHz
(c)	Frequency Channel:	60

(d) Ambient Operating Temperature Range: -40°F to 185°F (-40°C to 85°C)
(e) Humidity: 100%, IP68 Rating
(f) Channel Bandwidth: 430 KHz
(g) Maximum Output Power: 20dBm
(h) Dimensions: 2-inch H x 3.6-inch D
(i) Power: Replaceable "D" size Battery

(B) Access Point. Access Point and Antennas shall be mounted on a temporary traffic signal pole (wood), providing two-way wireless communication between Pods and Base Station. A mounting assembly shall be included with Access Point.

(1) Specifications:

(a) Frequency Band: 2400 to 2483.5 MHz for Base Station wireless link
902 to 928 MHz (ISM unlicensed band) for Pod wireless link
(b) Frequency Channel: 16 for Base Station wireless link
60 for Pod wireless link
(c) Ambient Operating Temperature Range: -35°F to 167°F (-37°C to 75°C)
(d) Humidity: 100%, IP68 Rating
(e) Channel Bandwidth: 2 MHz for Base Station wireless link
430 KHz for Pod wireless link
(f) Dimensions: 6.3-inch H x 7.9-inch W x 7.9-inch D
(g) Antennas: Omnidirectional-sensors up to 250 ft.
Directional Panel-sensors up to 700 ft.

(2) Access Point assembly shall contain the following:

TABLE 770.14-1 - ACCESS POINT ASSEMBLY

Item	Quantity
Radios	3
Interface Connector Kit	1
900 MHz Antenna	1
RF Cable	1
Mounting Bracket for Antenna	1
Lighting Suppressor for Antenna	1
Mounting Bracket for Access Point	1
¼-inch Washer	4
¼-inch 20 nut for mounting	4

(C) Base Station. Base Station is the central controller of the Pod Wireless Detector System. Base Station shall be rack mounted and installs into an existing loop detector rack in the Model 332A cabinet. Base Station shall be compatible with Model 170ATC controller.

(1) Specifications:

(a) Frequency Band: 2400 to 2483.5 MHz for Base Station wireless link
902 to 928 MHz (ISM unlicensed band) for Pod wireless link

(b) Frequency Channel: 16 for Base Station wireless link
60 for Pod wireless link

(c) Ambient Operating Temperature Range: -35°F to 167°F (-37°C to 75°C)

(d) Humidity: 100%, IP68 Rating

(e) Channel Bandwidth: 2 MHz

(f) Memory: 512 MB

(g) Dimensions: 4.5-inch H x 72.3-inch W x 6.97-inch D

(2) Base Station shall include cab mount antenna, RPTCNC to RPSMA RF Cable and Power Panel.

(D) Expansion Card. Expansion Card increases the capabilities of the four channel input of the base station. Expansion Card shall be located in the control cabinet and installs into existing loop detector rack.

(1) Specifications:

(a) Input/Output Voltage: 11 to 26 VDC.

(b) Operating Temperature: -35°F to 167°F (-37°C to 75°C)

(c) Humidity: 95% max non condensing

(d) Power Consumption: 3 mA per channel

(e) Dimensions: 7.0-inch L x 4.5-inch H x 1.1-inch W

(f) Weight: 0.2 lbs

(2) Expansion Card shall include one TS1/332 Expansion Card Cable Harness.

(E) Polyurethane/Polyurea Based Joint Sealant. Polyurethane/Polyurea Based Joint Sealant shall be two component 100% solid hybrid, self-levelling sealant.

(1) Application: Sealant shall be applied in 450ml plural component cartridges for use with dual tube applicator. Application Temperature Range is 20°F to 167°F.

(2) Physical Properties:

		2:1	1:1
Tensile Strength (PSI)	ASTM D412	2950	1500
100% Modulus	ASTM D412	1620	1400
Tear Strength (PLI)	ASTM D412	500	450
Hardness (Shore A)	ASTM D2240	95A	85A
Flexibility (1/8 "Mandrel)	ASTM D1737	Pass	Pass
Flashpoint (° F)	ASTM	>200	>200
Viscosity	B Side CPS	1200	1200
Viscosity	A Side CPS	400	1800

(3) Processing Properties:

Gel Time	Minutes	2	5
Tack Free Time	Minutes	5	10
Open to Industrial Traffic	Minutes	15	30"

(VII) Add **Subsection 770.15 Span Wire Assembly** to read as follows:

"770.15 Span Wire Assembly

Span Wire Assembly attached to the temporary traffic signal pole (wood) shall be used to mount overhead traffic signals over the roadway. The span wire assembly consists of high strength tether cables, messenger cables, guy wires with caisson, foundations, and risers. Span Wire Assembly shall mount traffic signals, signs, and emergency preemption detectors a minimum of 17ft over the roadway as shown on the traffic signal plans. Span Wire Assembly shall also allow mounting of CCTV Camera and other appurtenances as related to traffic signal system onto the temporary traffic signal poles (wood).

Design of the span wire assembly shall conform to AASHTO's Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals (2013). See traffic signal plans for more details. Spans greater than 120' shall be submitted to the Engineer for approval prior to ordering materials."

END OF SECTION 770

PROPOSAL SCHEDULE					
ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
201.0000	Clearing and Grubbing	146	S.Y.	$ _____	$_____
202.0010	Removal of Existing Traffic Signs	L.S.	L.S.	L.S.	$_____
202.0020	Removal of Existing AC Pavement	L.S.	L.S.	L.S.	$_____
203.0000	Roadway Excavation	L.S.	L.S.	L.S.	$_____
209.0100	Installation, Maintenance, Monitoring, and Removal of BMP	L.S.	L.S.	L.S.	$_____
209.0200	Additional Water Pollution, Dust, and Erosion Control	F.A.	F.A.	F.A.	$ 50,000.00
301.0000	Hot Mix Asphalt Base Course	53	TONS	$ _____	$_____
401.0000	HMA Pavement Mix No. IV	23	TONS	$ _____	$_____
623.0000	Traffic Signal System	L.S.	L.S.	L.S.	$_____
627.0200	HELCO Utilities	F.A.	F.A.	F.A.	$ 50,000.00
629.0010	Single 4-Inch Pavement Striping (Thermoplastic) (468 L.F.)	L.S.	L.S.	L.S.	$_____
629.0020	Double Yellow 4-Inch Pavement Striping (Thermoplastic) (47 L.F.)	L.S.	L.S.	L.S.	$_____
629.0030	Profiled 4-Inch Pavement Striping (Thermoplastic) (160 L.F.)	L.S.	L.S.	L.S.	$_____
629.0040	8-Inch Pavement Striping (Thermoplastic) (302 L.F.)	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE					
ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
629.0050	12-Inch Pavement Striping (Thermoplastic) (101 L.F.)	L.S.	L.S.	L.S.	$_____
629.0060	Pavement Arrow (Thermoplastic)	2	EACH	$ _____	$_____
629.0070	Type C Pavement Markers (41 Each)	L.S.	L.S.	L.S.	$_____
629.0080	Type D Pavement Markers (3 Each)	L.S.	L.S.	L.S.	$_____
629.0090	Type H Pavement Markers (1 Each)	L.S.	L.S.	L.S.	$_____
629.0100	Removal of Exist. Pavement Striping	L.S.	L.S.	L.S.	$_____
631.0000	Regulatory and Warning Sign (10 Square Feet or Less) with Posts	10	EACH	$ _____	$_____
632.0000	Type II Post Mounted Object Marker	9	EACH	$ _____	$_____
636.0000	Bolt Down Curbing with Delineators	1025	LF	$ _____	$_____
645.1000	Traffic Control	L.S.	L.S.	L.S.	$_____
645.2000	Additional Police Officers And/or Additional Control Device	F.A.	F.A.	F.A.	$ 50,000.00
648.0100	Field-Posted Drawings	L.S.	L.S.	L.S.	$_____
699.1000	Mobilization (Not to Exceed 6 Percent of the Sum of All Items Excluding the Bid Price of this Item)	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE					
ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT

Sum of All Items ..... $ _____

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

VOLCANO ROAD
TEMPORARY SIGNAL INSTALLATION AT KIPIMANA STREET
PROJECT NO. 11N-01-19M

PRE-BID MEETING MINUTES
JUNE 5, 2019

The following are minutes for the Hawaii Department of Transportation (HDOT) pre-bid meeting with prospective bidders for the Temporary Signal Installation at Kipimana Street project.

The meeting was held at the Highways Hawaii District Office Design Conference Room, 50 Makaala Street, Hilo, Hawaii 96720 at 9:00am. Julann Sonomura conducted the meeting.

There were no attendees. The meeting ended at 9:05 am.

The following questions were received via e-mail subsequent to the pre-bid meeting:

Questions:

1) The plans call for delineators but there is no detail for them. Please provide details.

   Added detail and specifications for bolt down curb with delineators.

2) Please confirm that H-4 rated wood poles are required. Class III poles are commonly used for this application.

   The restrictions on the class of wood in the specifications can be removed; however, details shall be submitted to the Engineer prior to installation for review and acceptance by the structural engineer.

3) Detail 4/TS3 on sheet 17 specifies a pole band to be used to attach the messenger and tether cable to the wood poles. Can a thru-bolt and guy hook be used in lieu of the pole band.

   Thru-bolt and guy hook in lieu of pole band is acceptable.

4) Please confirm if street lights are required on the temporary wood poles.

   Street lights are not required.

5) Please confirm if the Opticom Receiver can be mounted on the wood poles instead of on the messenger cable. The Opticom will work more reliably when it is mounted on a fixed object.

Opticom Receiver mounted on wood pole instead of messenger cable is acceptable.

6) Please confirm that there are no traffic signs to be mounted to the messenger/tether wires.

Confirmed

7) Section A-A on sheet 24 specifies a Nema 4X stainless steel enclosure for the meter main combination. Can a Nema-3R 316 SS enclosure be substituted?

A NEMA 4X 316 SS should be installed.

8) The one line diagram on sheet 23 specifies (1) one new 3" PVC pole riser conduit. Typical riser detail on sheet 25 specifies 1-length 3" PVC SCH40 conduit up pole but shows (2). Please clarify if one or two conduits are required.

One 3" PVC Sch 40 should be rising up the pole

9) Is there a communication conduit to the utilities or will communication be via wireless system?

No; the traffic signal is designed as stand alone

10) Detail 1/TS3 on sheet 17 specifies at ½" diameter galvanized steel messenger/span cable. We would like to use a 3/8" diameter cable in lieu of the ½".

Please use ½" diameter

11) Detail 1/TS3 on sheet 17 specifies (1) one messenger/span cable and guy wires to carry the control cables and traffic signal heads. We would like to suggest the use of (2) two 3/8" cables and guy wires, one for all the cables and one for just the traffic signal heads.

Please use one (1) messenger/span cable

12) Detail 2/TS3 and 3/TS3 on sheet 17 specifies the use of Three bolt cable clamps. We would like to use of a guy hook and preform guy grips in lieu of the three bolt clamps.

The use of a guy hook and preform guy grips in lieu of the three bolt clamps is acceptable.

13) Details on sheet 24 do not specify a ground rod in the controller and UPS foundations. Is a ground rod required?

Yes, a ground rod is required in the controller and UPS foundations. A concrete encased electrode (Ufer ground) will be required per Section 250-50(C) of the National Electrical Code.

14) Details on sheet 24 do not specify a drain pipe in the controller and UPS foundations. Is a drain pipe required?

Yes, a 1" diameter conduit will need to be installed for drainage.

15) Detail 1/TS3 on sheet 17 specify for the riser pipe, a 2" sch. Galvanized rigid steel conduit with straps at 5' o.c. all the way up the pole. Please provide approval to install galvanized rigid riser pipe 10' from ground then schedule 40 PVC conduit the rest of the way.

Installation of galvanized rigid riser pipe 10' from ground then schedule 40 PVC conduit the rest of the way is acceptable

16) There are no factory certified traffic signal techs on island. There are traffic signal techs that are familiar with the systems being used on island however they are not factory certified. Please provide approval to use qualified on island traffic signal techs that are not factory certified.

Qualified signal technicians acceptable under the supervision of factory certified technicians

17) The conduit and cable schedule on sheet 16 specifies Type 1, Type 6, and Type 7 cables. Please clarify what type of cables these are.

Types are as specified in Section 770.06, Standard Specifications, State of Hawaii, 2005. Type 1: Signal Loop Cable, 14 AWG copper; 26 conductor cable. Type 6: Electrical Service Cable. Type 7: Preemption Detectyor (Opticom) Cable.

18) The conduit and cable schedule on sheet 16 appears to show all cables to be installed in one conduit. Will the 120V traffic cables be installed in the same 2" conduit at the low voltage cables? Please confirm.

Confirmed

19) Detail 5/TS3 on sheet 17 specifies a 4"x4"x1/2" thk ASTM A36 curved plate washer at thru bolt. ½" thick plate washers are not commonly used

or available. Please provide approval to use two ¼" thk plate washers in lieu of the ½" plate washer.

Use of two ¼" thick plate washers in lieu of ½" plate washer is acceptable.

20) Please clarify what size and number of conductor cable or cables are required to be strung across the highway via the messenger cable.

Updated tables to reflect the information.

21) Traffic signal note #4 on sheet 15 specifies a solid #8 bar copper wire shall run with the traffic signal control cable for equipment ground. Since the copper ground wire will be strung overhead, would it be acceptable to install a solid #8 insulated copper wire instead? The insulation will help protect the ground wire from the elements.

Changed note from "bare" to "insulated".

22) Project completion time on the proposal is 90 working days from the start work date from the department. Materials and equipment have long lead times. Please confirm start work date will be set after all the materials and equipment have been acquired.

See paragraph 108.01 - Notice to Proceed will be 30 days after Contract certification which is ahead of the physical Start Work Date. By definition, Notice to Proceed is the date that the contractor is to begin procuring materials. Contractor will be allowed 60 days after the NTP to the Start Work Date

23) Detail 1/TS5 note #4 on Sheet 19 specifies Aldrin or Dursban for the termite treatment of the wood pole bases. We have contacted several local pest companies and they all said that Aldrin or Dursban is no longer used or available. Please confirm that alternate manufacturers will be acceptable for the chemical termite treatment.

Alternate termite treatment is subject to approval by the Engineer

24) For proposal item 631.0200 Regulatory and Warning Signs (more than 10 SF), the plans don't seem to call out any signs that big.

Line item has been removed from proposal schedule

25) Title sheet on the bid set shows 26 sheets but there are only 25 sheets; which is correct?

There are 25 sheets in the project plan set