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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. Must and shall when used in a directive to or describing the use of an action needed to be done by the Contractor are considered mandatory contractual duty of the Contractor.

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
MASH	AASHTO'S Manual for Assessing Safety Hardware
MTRB	HDOT's Material and Testing Branch
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, 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.

Informational Submittal – A submittal, e.g., direct submittal or fax by the contractor to the Material Testing and Research Branch, of such things as contractor QC test results or schedules that are designated as an Informational Submittal. It is a process to inform the receiver of a task that has been performed or will soon be performed. Submitted for workload scheduling purposes; it does not require a response or action from the designated receiver, in general, is not used for payment purposes unless the Engineer or MTRB designated as such.

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 in Subsection 108.08 - Liquidated Damages for Failure to Complete the Work or Portions of the Work on Time, 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. State of Hawaii Standard Specifications for Road and Bridge Construction 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, joint venture or other legal entity, as licensed or required to be licensed under Chapter 444, 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 has 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 106 – MATERIAL RESTRICTIONS AND REQUIREMENTS

Make the following amendment to said Section:

(I) Amend **106.05(B) – Deviation** by revising the third sentence from line 106 to 108 to read as follows:

"Any deviations will be subject to Subsection 102.14 – Substitution of Materials and Equipment Before Bid Opening.

(II) Amend **106.11 Steel and Iron Construction Material**. by revising lines 238 to 277 to read as follows:

"**106.11 Steel and Iron Construction Material**. For Federal- Aid Projects, the major quantities of steel and iron construction material that are permanently incorporated into the project shall consist of American-made materials only in accordance with 23 CFR Subpart 635.410 and 49 CFR 661.

The Contractor may utilize minor amounts of foreign steel and iron provided the cost of the foreign material used does not exceed one-tenth of 1 percent of the total contract cost or $2,500.00, whichever is greater.

American-made material is defined as material having all manufacturing processes occur in the United States. The action of applying a coating to steel or iron is deemed a manufacturing process. Coating includes epoxy coating, galvanizing, aluminizing, painting, and any other coating that protects or enhances the value of steel or iron. Any process from the original reduction from ore to the finished product constitutes a manufacturing process for iron. The following are considered to be steel manufacturing processes.

(1) Production of steel by any of the following processes:

(a) Open hearth furnace.

(b) Basic Oxygen.

(c) Electric Furnace.

(d) Direct Reduction.

(2) Rolling, heat treating, and any other similar processing.

(3) Fabrication of the products.

(a) Spinning wire into cable or strand.

(b) Corrugating and rolling into culverts.

(c) Shop fabrication.

A certification of materials origin will be required for any items comprised of, or containing steel or iron construction materials prior to such items being incorporated into the permanent work."

END OF SECTION 106

SECTION 107 - LEGAL RELATIONS AND RESPONSIBILITY TO PUBLIC

Make the following amendments to said Section:

(l) Amend **Section 107.01 Insurance Requirements** from lines 5 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. Refer to SPECIAL CONDITIONS for any additional requirements.

(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. Refer to SPECIAL CONDITIONS for any additional requirements.

(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. Refer to SPECIAL CONDITIONS for any additional requirements."

(II) Amend **107.06 Contractor Duty Regarding Public Convenience** from lines 195 to 201 to read:

"**107.06 Contractor Duty Regarding Public Convenience.** Plan and provide appropriate methods, devices, work, etc., e.g., detours, signs, flashers, labor, equipment, high load warnings, other types of warnings devices, barricades, barriers, debris catchment systems, that must all comply with the Contract Documents. The aforementioned must ensure the safety of the traveling public at all times. The work must be conducted in a manner and in a sequence that ensures the least possible interference, along with the maximum possible safety to the traveling public, e.g., pedestrians, bicycles, motorcycles, moped vehicles, and those using them, including the roadway, and roadside."

(III) Amend 107.12 **Protection of Persons and Property**
(B) Safety Precautions and Programs from lines 312 to 316 to read:

"**(B) Safety Precautions and Programs** Contractor shall notify owners of adjacent properties and all utilities when performing work that may affect the owners. Also notify the owners when the work may be in or adjacent to the area of the properties including utilities. Provide protection acceptable to the owners and the Engineer. Cooperate with the owners and Engineer. Receive their acceptance of the protection, removal, repair, or replacement of their property or utility, before, during, and after the work.

Must not permit any load to be placed on the work, any structure, roadway, or any other location that may endanger at any level the safety of any persons or may cause damage to any property or facility."

END OF SECTION 107

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 7 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 21 calendar days of date of award. 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 7 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 7 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 certification date. Keep copies 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. 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, haul tags as applicable, or any documentation as requested by the Engineer. Notify Engineer at minimum 48 hours prior to removal of material from site. All material not used on the project shall be considered solid waste. If the Contractor elects to reclassify the solid waste as inert fill, follow the requirements in Section 219 -Determination and Characterization of Fill Material.

(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.

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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.* • *Collect and dispose of all waste materials in trash dumpsters. Place dumpsters, with secure watertight lids, away from storm water conveyances and drains, in a covered materials storage area.* • *Dispose of construction and non- construction solid waste in accordance with State DOH regs.* • *Load removed non- recyclable vegetation directly onto trucks; cover and transport to a licensed facility*	*See Solid Waste Management Section SM-6. Storm Drain Inlet Protection SC-1, and Perimeter Sediment Controls where applicable.*

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Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
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.* • *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 Storage and Handling Section SM-2 for additional requirements.*	*See Vehicle and Equipment Cleaning, Maintenance, and Refueling, Sections SM-11, SM-12, and SM-13, and Material Storage and Handling, Section SM-2, and Spill Prevention and Control SM-10.*

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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-1, Perimeter Controls and Sediment Barriers, Sediment Basins and Detention Ponds, Check Dams SC-3 ,Level Spreader EC-6, Paving Operations SM-20, Construction Roads and Parking Area Stabilization SC-10, Controlling Storm Water Flowing Onto and Through the Project, Post-Construction BMPs, and Non-Structural BMPs (Construction BMP Training SM-1, Scheduling SM-14, Location of Potential Sources of Sediment SM-15, Preservation of Existing Vegetation SM-17).* • *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 Chapter 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 designed for steep grades.* • *For temporary drains and swales use velocity dissipation devices within and at the outlet to minimize erosive flow velocities.*	*Soil Stabilization* *1. SM-22 Topsoil Management* *2. EC-12 Seeding and Planting* *3. EC-14 Mulching* *4. EC-11 Geotextiles and Mats* *Slope Protection* *1. EC-12 Seeding and Planting* *2. EC-14 Mulching* *3. EC-11 Geotextiles and Mats* *4. EC-4 Slope Roughening, Terracing, and Rounding* *5. EC-7 Slope Drains and Subsurface Drains* *6. EC-9 Slope Interceptor or Diversion Ditches/Berms* *SC-1 Storm Drain Inlet Protection*

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Pollutant Source	***Appropriate Site-Specific BMP to be Implemented***	*BMP Requirements*
		Perimeter Controls and Sediment Barriers *1. SC-7 Silt Fence or Filter Fabric Fence* *2. SC-2 Vegetated Filter Strips and Buffers* *3. SC-6 Compost Filter Berm/Sock* *4. SC-8 Sandbag Barrier* *5. SC-9 Brush or Rock Filter* *Sediment Basins and Detention Ponds* *1. SC-4 Sediment Trap* *2. SC-5 Sediment Basin* *SC-3 Check Dams* *EC-6 Level Spreader* *SM-20 Paving Operations* *SC-10 Construction Roads and Parking Area Stabilization*

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Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
		Controlling Storm Water Flowing onto and Through the Project *1. EC-3 Run-On Diversion* *2. EC-5 Earth Dike, Swales and Ditches* *Post Construction BMPs* *1. EC-2 Flared Culvert End Sections* *2. EC-10 Rip-Rap and Gabion Inflow Protection* *3. EC-8 Outlet Protection and Velocity Dissipation Devices* *4. SM-22 Topsoil Management* *Non-Structural BMPs* *1. SM-1 Construction BMP Training* *2. SM-14 Scheduling* *3. SM-15 Location of Potential Sources of Sediment* *4. SM-17 Preservation of Existing Vegetation*

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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 Stockpile Management Section SM-3 for additional requirements.*	*See Stockpile Management Section SM-3. Storm Drain Inlet Protection SC-1, 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 Storage and Handling Section SM-2 and Paving Operations Section SM-20 for additional requirements.* • *Provide Storm Drain Inlet Protection and/or Perimeter Sediment Controls as applicable.*	*See Material Storage and Handling Section SM-2,* and Stockpile Management Section SM-3, *Paving Operations Section SM-20, Storm Drain Inlet Protection SC-1, and Perimeter Sediment Controls where applicable.*

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Pollutant Source	***Appropriate Site-Specific BMP to be Implemented***	***BMP Requirements***
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 Storage and Handling Use SM-2, Hazardous Materials and Waste Management Section SM-9, Spill Prevention and Control Section SM-10, and Structure Construction and Painting Section SM-21 for additional requirements.* *Provide Storm Drain Inlet Protection and/or Perimeter Sediment Controls as applicable.*	*See Material Storage and Handling Use Section SM-2, Stockpile Management Section SM-3, Hazardous Materials and Waste Management Section SM-9, Waste Management, Spill Prevention and Control Section SM-10, and Structure Construction and Painting Section SM-21, Storm Drain Inlet Protection SC-1, and Perimeter Sediment Controls where applicable.*

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Pollutant Source	***Appropriate Site-Specific BMP to be Implemented***	***BMP Requirements***
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 safety data sheets (formerly MSDS) 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 and disposal instructions. Document departures from manufacturer's specifications in Attachment J.* • *Apply fertilizers at the appropriate time of year for the location, and preferably timed to coincide as closely as possible to the period of maximum vegetation uptake and growth.* • *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.*	*See Material Storage and Handling Use Section SM-2, Stockpile Management Section SM-3, and Hazardous Materials and Waste Management Section SM-9, and Spill Prevention and Control SM-10*

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Pollutant Source	*Appropriate Site-Specific BMP to be Implemented*	*BMP Requirements*
	• *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 Storage and Handling Use SM-2, and Hazardous Materials and 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.*	*See Hazardous Materials and Waste Management Section SM-9 and Vehicle and Equipment Maintenance SM-12*

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Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
	• *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 Materials and Waste Management Section SM-9 and Vehicle and Equipment Management, Vehicle and Equipment Maintenance SM-12 for additional requirements.*	
Metals and Building Materials	• *Inspect construction waste and recycling areas 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.*	*See Solid Waste Management Section SM-6*
Contaminated Soil	• *See Waste Management, Contaminated Soil Management Section SM-8 and/or Hazardous Materials and 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 Materials and Waste Management Section SM-9*

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Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
Fugitive Dust Control and 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.* • *Minimize exposed areas through the schedule of construction activities.* • *Utilize vegetation, mulching, sprinkling, and stone/gravel layering to quickly stabilize exposed soil.* • *Direct construction vehicle traffic to stabilized roadways.* • *Cover dump trucks hauling material from the site with a tarpaulin.* *See Dust Control Section SM-19 for additional requirements.*	*See Dust Control Section SM-19*
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 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 Wash and Waste Management Section SM-4 for additional requirements.*	*See Waste Management, Concrete Wash and Waste Management Section SM-4*

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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 that remove sediment prior to exit when minimum dimensions cannot be met.* *See Stabilized Construction Entrance/Exit Section SC-11 for additional requirements.*	*See Stabilized Construction Entrance/Exit Section SC-11*
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-12 and California Stormwater BMP Handbook SD-12 Efficient Irrigation included in SWPPP Attachment A for additional requirements.*	*See Seeding and Planting Section EC-12 and California Stormwater BMP Handbook SD-12 Efficient Irrigation*
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.*

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Pollutant Source	***Appropriate Site-Specific BMP to be Implemented***	***BMP Requirements***
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-18 for additional requirements.*	*See Dewatering Operations SM-18. 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-20 for additional requirements.* *Provide Storm Drain Inlet Protection and/or Perimeter Sediment Controls as applicable.*	*See Paving Operations Section SM-20, Storm Drain Inlet Protection SC-1, Perimeter sediment controls where applicable*
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 included in SWPPP Attachment A for additional requirements.*	*See California Stormwater BMP Handbook NS-12 Concrete Curing*

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Pollutant Source	Appropriate Site-Specific BMP to be Implemented	BMP Requirements
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, Storage and Handling Use SM-2, Stockpile Management Use Section SM-3, and Hazardous Materials and Waste Management Section SM-9 for additional requirements.*	*See Material, Storage and Handling Use Section SM-2, Stockpile Management Use Section SM-3, and Hazardous Materials and Waste Management Section SM-9*
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 Waste Section SM-7 for additional requirements.*	*See Sanitary Waste Section SM-7.*

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619 **END OF SECTION 209**

Make the following Section a part of the Standard Specifications:

"SECTION 219 – DETERMINATION AND CHARACTERIZATION OF FILL MATERIAL

219.01 Description. This section describes determination and characterization of fill material for project sites.

Requirements of this section apply to all waste generated from construction and demolition (C&D) activities on the project.

219.02 Definitions.

(A) Inert Fill Material. Inert Fill Material is defined in the Hawaii Revised Statutes (HRS) 342H-1. Materials that do not meet this definition shall be disposed of at the appropriate Hawaii Department of Health (HDOH) Solid and Hazardous Waste Branch permitted solid waste management facility.

The October 2021 State of Hawaii Department of Transportation, Highways Division, Construction Best Management Practices Field Manual, specifies inert fill material shall not be contaminated with asbestos or lead-based paint. In addition, inert fill materials do not decompose or produce leachate or other products harmful to the environment.

219.03 Construction.

(A) Preconstruction Requirements. Retain the services of an Environmental Professional as accepted by the Engineer. Submit documentation the Environmental Professional has a minimum of five (5) years of experience in solid and hazardous waste management and fill material characterization within 30 calendar days of contract certification date.

(B) Construction Requirements.

(1) Reclassification of Solid Waste into Inert Fill Material. If reclassifying solid waste as inert fill, obtain written acceptance from the Engineer before following the requirements of Section 219.03(B)(2) Inert Fill Material.

(2) Inert Fill Material. The State reserves the right to reject imported fill from sources known to contain hazardous material or if any of the requirements in this specification are not met. The source and/or stockpiled location of the material shall remain accessible at all

times to State personnel for sampling, testing, and inspection as determined by the Engineer. Prior to importing/removal of material, the Contractor shall provide the specific location and quantity of material that is to be transported to/from the project site.

(a) Certificates. Provide a written certificate indicating that the fill material meets the inert fill material definition specified herein. The written certificate shall include a description of the evidence (including but not limited to historical documentation of land use, test results, fill material characterization report, and/or Phase I Environmental Site Assessment) used by the Contractor to determine that the fill material is inert fill material. The written certificate shall be prepared and signed by an Environmental Professional. Submit the written certificate to the Engineer 14 calendar days before the fill material is imported to or removed from the project site. Do not import the fill material to, or export the fill material from the project site until the Engineer has accepted the certificate. Revise the written certificate as requested by the Engineer until the Engineer has accepted the certificate at no additional cost to the State. If the Engineer does not accept the certificate, the fill material shall not be considered inert fill material; and the Contractor shall dispose of the fill material in accordance with all applicable Federal, state, and Local laws and regulations at no additional cost to the State.

(b) Documentation. Provide documentation that the material will be taken to a properly permitted site. At minimum the documentation shall include the location of the disposal site (name, address, Tax Map Key No., telephone number, and map) with a revised Solid Waste Disclosure Form to indicate the material that was reclassified as inert fill and the location that the inert fill will be taken to.

(c) Laboratory Certification. Samples shall be tested by a laboratory certified to perform the specific analyses.

(d) Hawaii Department of Health Guidance Documents. The HDOH has published guidance documents for the characterization of fill material and construction and demolition (C&D) waste. Comply with all applicable Federal, State, and Local laws and regulations. The procedures of the most recent versions of the following guidance documents or their replacements for the determination and characterization of the fill material or waste may be used as a reference:

1. Guidance for Soil Stockpile Characterization and Evaluation of Imported and Exported Fill Material.

2. Evaluation of Fill Material for Chemical Contaminants (Fact Sheet).

3. Guidance for Construction & Demolition (C&D) Waste Disposal.

4. Technical Guidance Manual for the Implementation of the Hawaii State Contingency Plan

Obtain and follow the latest versions of the applicable HDOH guidance documents**.**

219.04 Measurement. Determination and characterization of fill material will be paid on a lump sum basis. Measurement for payment will not apply.

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

Pay Item	**Pay Unit**
Determination and Characterization of Fill Material	Lump Sum

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

END OF SECTION 219

Amend **Section 401 – HOT MIX ASPHALT (HMA) PAVEMENT** to read as follows:

"SECTION 401 – HOT MIX ASPHALT (HMA) PAVEMENT

401.01 Description. This section describes furnishing and placing dense graded HMA pavement (herein referred to as HMA) on a prepared surface.

401.02 Materials.

Asphalt Cement (PG 64-16)	702.01A

Use for non-surface mixes, unless otherwise specified in the project documents.

Asphalt Cement (PG 64E-22)	702.01B

Use for all surface mixes, except for on Lanai and Molokai, and unless otherwise specified in the project documents. Polymer modified asphalt (PMA) pavement refers to asphalt mix using PG 64E-22, unless otherwise indicated.

Emulsified Asphalt	702.04
Warm Mix Asphalt Additive	702.06
Aggregate for Hot Mix Asphalt Pavement	703.09
Filler	703.15
Hydrated Lime or a liquid anti-strip approved by the engineer	712.03

(A) General. HMA pavement shall be plant mixed and shall include mixture of aggregate and asphalt binder and may include reclaimed asphalt pavement (RAP) or filler, or both.

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.

HMA pavement shall include surface course and may include one or more binder courses, depending on HMA pavement thickness indicated in the contract documents.

RAP is defined as removed or reprocessed pavement materials containing asphalt and aggregates. Process RAP by crushing until 100 percent of RAP passes 3/4-inch sieve. Size, grade uniformly, and combine materials such that blend of RAP and aggregate material conforms to

grading requirements of Subsection 703.09 - Aggregate for Hot Mix Asphalt Pavement.

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

Quantity of filler material to correct deficiencies in aggregate gradation passing the No. 200 sieve shall not exceed 3 percent by weight of fine aggregates.

(B) Job-Mix Formula and Tests. Design job-mix formula in accordance with procedures contained in current edition of Asphalt Institute's *Mix Design Methods for Asphalt Concrete and Other Hot Mix Types,* Manual Series No. 2 (MS-2) for either Marshall Method or Hveem Method of Mix Design.

Limit compacted lift thickness and asphalt content of job-mix formula as specified in Table 401.02-1 - Limits of Compacted Lift Thickness and Asphalt Content.

TABLE 401.02-1 - LIMITS OF COMPACTED LIFT THICKNESS AND ASPHALT CONTENT

MIX NO.	II	III	IV	V
Minimum to Maximum Compacted Thickness for Individual Lifts (Inches)	2-1/4 to 3	2 to 3	1-1/2 to 3	1-1/4 to 3
Asphalt Content Limits (Percent of Total Weight of Mix)	3.8 to 6.1	4.3 to 6.1	4.3 to 6.5	4.8 to 7.0

Asphalt content limits for porous aggregate may be exceeded only if it is requested ahead of placement and is reviewed then accepted in writing by the Engineer.

Meet job-mix formula design criteria specified in Table 401.02-2 - Job-Mix Formula Design Criteria.

TABLE 401.02-2 - JOB-MIX FORMULA DESIGN CRITERIA	
Hveem Method Mix Criteria (AASHTO T 246 and AASHTO T 247)	
Stability, minimum	37
Air Voids (percent)[1]	3 - 5
Marshall Method Mix Criteria (AASHTO T 245)	
Compaction (number of blows each end of specimen)	75
Stability, minimum (pounds)	1,800
Flow (x 0.01 inch)	8 - 16
Air Voids (percent)[1]	3 - 5
Notes: 1. Air Voids: AASHTO T 166 or AASHTO T 275; AASHTO T 209, AASHTO T 269.	

Minimum percent voids in mineral aggregates (VMA) of job-mix formula shall be as specified in Table 401.02-3 - Minimum Percent Voids in Mineral Aggregates (VMA).

TABLE 401.02-3 - MINIMUM PERCENT VOIDS IN MINERAL AGGREGATES (VMA)					
Nominal Maximum Particle Size, (Inches)	1-1/2	1	3/4	1/2	3/8
VMA, (percent)[1]	11.0	12.0	13.0	14.0	15.0
Notes: 1. VMA: See Asphalt Institute Manual MS-2					

(C) Submittals. Establish and submit job-mix formula for each type of HMA pavement mix indicated in the contract documents a minimum of 30 days before paving production. Job mix shall include the following applicable information:

(1) Design percent of aggregate passing each required sieve size.

(2) Design percent of asphalt binder material (type determined by type of mix) added to the aggregate (expressed as % by weight of total mix),

(3) Design proportion of processed RAP.

(4) Design temperature of mixture at point of discharge at paver.

(5) Source of aggregate.

(6) Grade of asphalt binder.

(7) Test data used to develop job-mix formula.

Except for item (4) in this subsection, if design requirements are modified after the Engineer accepts job-mix formula, submit new job-mix formula before using HMA produced from modified mix design. Submit any changes to the design temperature of mixture at point of discharge for acceptance by the Engineer.

Submit a certificate of compliance for the asphalt binder, accompanied by substantiating test data from a certified testing laboratory.

(D) Range of Tolerances for HMA. Provide HMA within allowable tolerances of accepted job-mix formula as specified in Table 401.02-4 - Range of Tolerances HMA. These tolerances are not to be used for the design of the job mix, they are solely to be used during the testing of the production field sample of the HMA mix.

TABLE 401.02-4 - RANGE OF TOLERANCES HMA	
Passing No. 4 and larger sieves (percent)	± 7.0
Passing No. 8 to No. 100 sieves (inclusive) (percent)	± 4.0
Passing No. 200 sieve (percent)	± 3.0
Asphalt Content (percent)	± 0.4
Mixture Temperature (degrees F)	± 20

The tolerances shown are the allowable variance between the physical characteristics of laboratory job mix submitted mix design and the production or operational mix, i.e., field samples.

401.03 Construction.

(A) Weather Limitations. Placement of HMA shall not be allowed under the following conditions:

(1) On wet surfaces, e.g., surface with ponding or running water, surface that has aggregate or surface that appears beyond surface saturated dry, as determined by the Engineer.

(2) When air temperature is below 50 degrees F and falling. HMA may be applied when air temperature is above 40 degrees F and rising. Air temperature will be measured in shade and away from artificial heat.

(3) When weather conditions prevent proper method of construction.

(B) Equipment.

(1) Mixing Plant. Use mixing plants that conform to AASHTO M 156, supplemented as follows:

(a) All Plants.

1. Automated Controls. Control proportioning, mixing, and mix discharging automatically. When RAP is incorporated into mixture, provide positive controls for proportioning processed RAP.

2. Dust Collector. AASHTO M 156, Requirements for All Plants, Emission Controls is amended as follows:

Equip plant with dust collector. Dispose of collected material. In the case of baghouse dust collectors, dispose of collected material or return collected material uniformly.

3. Modifications for Processing RAP. When RAP is incorporated into mixture, modify mixing plant in accordance with plant manufacturer's recommendations to process RAP.

(b) Drum Dryer-Mixer Plants.

1. Bins. Provide separate bin in cold aggregate feeder for each individual aggregate stockpile in mix. Use bins of sufficient size to keep plant in continuous operation and of proper design to prevent overflow of material from one bin to another.

2. Stockpiling Procedures. Separate aggregate for Mix II, Mix III and Mix IV into at least three stockpiles with different gradations as follows: coarse,

intermediate, and fine. Separate aggregates for Mix V into at least two stockpiles. Stockpile RAP separately from virgin aggregates.

3. Checking Aggregate Stockpile. Check condition of the aggregate stockpile often enough to ensure that the aggregate is in optimal condition.

(c) Batch and Continuous Mix Plants.

1. Hot Aggregate Bin. Provide bin with three or more separate compartments for storage of screened aggregate fractions to be combined for mix. Make partitions between compartments tight and of sufficient height to prevent spillage of aggregate from one compartment into another.

2. Load Cells. Calibrated load cells may be used in batch plants instead of scales.

(2) Hauling Equipment. Use trucks that have tight, clean, smooth metal beds for hauling HMA.

Thinly coat truck beds with a minimum quantity of non-stripping release agent to prevent mixture from adhering to beds. Diesel or petroleum-based liquid release agents, except for paraffin oil, shall not be used. Drain excess release agent from truck bed before loading with HMA.

Provide a designated clean up area for the haul trucks.

Equip each truck with a tarpaulin conforming to the following:

(a) In good condition, without tears and holes.

(b) Large enough to be stretched tightly over truck bed, completely covering mix. The tarpaulin shall be secured in such a manner that it remains stretched tightly over truck bed and HMA mix until the bed is about to be raised up in preparation for discharge.

(3) Asphalt Pavers. Use asphalt pavers that are:

(a) Self-contained, power-propelled units.

(b) Equipped with activated screed or strike-off assembly, heated if necessary.

(c) Capable of spreading and finishing courses of HMA mixtures in lane widths applicable to typical section and thicknesses indicated in the contract documents.

(d) Equipped with receiving hopper having sufficient capacity for uniform spreading operation.

(e) Equipped with automatic feed controls to maintain uniform depth of material ahead of screed.

(f) Equipped with automatic screed controls with sensors capable of sensing grade from outside reference line, sensing transverse slope of screed, and providing automatic signals to control screed grade and transverse slope.

(g) Capable of operating at constant forward speeds consistent with satisfactory laying of mixture.

(h) Equipped with a means 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.** Blaw-Knox bituminous pavers shall be equipped with the Blaw-Knox Materials Management Kit (MMK).

2. **Cedarapids Bituminous Pavers.** Cedarapids bituminous pavers shall be those that were manufactured in 1989 or later.

3. **Barber-Green/Caterpillar Bituminous Pavers.** 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}".

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

Submit for review and acceptance, prior to the start of using the paver for the placing of plant mix, a full description in writing of the means and methods that will be used to prevent the bituminous paver from having both aggregate and temperature segregation. Use of any paver that has not been accepted is prohibited until acceptance of the paver is received from the Engineer. Any pavement placed with an unaccepted paver will be regarded as not compliant work and may not be paid for and may require removal.

Supply a Certificate of Compliance that verifies that the manufacturer's approved means and methods used to prevent bituminous paver from having both aggregate and temperature segregation have been implemented on all pavers used on the project and are working in accordance with the manufacturer's requirements and Contract Documents.

(4) Rollers. Rollers shall be self-propelled, steel-tired tandem, pneumatic-tired, or vibratory-type rollers capable of reversing without shoving or tearing the just placed HMA mixture. Provide sufficient number, sequencing, type, and rollers of sufficient weight to compact the mixture to required density while mixture is still in workable condition unless otherwise indicated. Equipment shall not excessively crush aggregate. Operate rollers in accordance with manufacturer's recommendations and Contract Documents. The use of intelligent compaction is encouraged and may be required elsewhere in the Contract Documents.

(a) Steel-Tired Tandem Rollers. Steel-tired tandem rollers used for initial breakdown or intermediate roller passes shall have minimum gross weight of 12 tons and shall provide minimum 250-pound weight per linear inch of width on drive wheel.

Steel-tired tandem rollers used for finish roller passes shall have minimum total gross weight of 3 tons.

Do not use roller with grooved or pitted rolling drum or worn scrapers or wetting pads. Replace excessively worn scrapers and wetting pads before use.

(b) Pneumatic-Tired Rollers. Pneumatic-tired rollers shall be oscillating-type, equipped with smooth-tread pneumatic tires of equal size and diameter. Maintain tire pressure within 5 pounds per square inch of designated operational pressure when hot. Space tires so that gaps between adjacent tires are covered by following set of tires.

Pneumatic-tired rollers used for breakdown or intermediate roller passes shall have a ballast capable of establishing an operating weight per tire of not less than 3,000 pounds. Equip rollers with tires having minimum 20-inch wheel diameter with tires inflated to 70 to 75 pounds per square inch pressure when cold and 90 pounds per square inch when hot. Equip rollers with skirt-type devices to maintain temperature of tires during rolling operations.

Pneumatic-tired rollers used for kneading finished asphalt surfaces shall have a ballast capable of establishing an operating weight per tire of not less than 1,500 pounds. Equip rollers with tires having minimum 15-inch wheel diameter with tires inflated to 50 to 60 pounds per square inch pressure. If required, equip rollers with skirt-type devices to maintain temperature of tires during rolling operations.

(c) Vibratory Rollers. Vibratory rollers shall be steel-tired tandem rollers having minimum total weight of 3 tons. Equip vibratory rollers with amplitude and frequency controls and speedometer. Operate vibratory roller in accordance with manufacturer's recommendations. For very thin lifts, 1 inch or less in thickness, vibratory rollers shall not be used in the vibratory mode. Instead, operate the unit in the static mode.

(5) Hand Tools. Keep hand tools used in production, hauling, and placement of HMA clean and free of contaminants. Diesel or mineral spirits or other cleaning material that is potentially deleterious to HMA may be used to clean hand tools providing:

(a) It does not contaminate HMA with cleaning material.

(b) Clean hand tools over catch pan with capacity to hold all the cleaning material.

(c) Remove all diesel or mineral spirits or other cleaning material that is potentially deleterious to HMA from hand tools before using with HMA.

(d) Hand tools used shall be in a condition such that it meets the requirements that it was manufactured for, e.g., a straightedge shall meet the straightness requirement of the manufacturer.

(6) Material Transfer Vehicle (MTV).

(a) Usage. MTV usage applies to surface courses of paving projects on all Islands except Lanai, unless otherwise indicated. When placing HMA surface course use MTV to independently deliver mixtures from hauling equipment to paving equipment. MTV usage will not be required for the following:

1. Projects with less than 1,000 tons of HMA.

2. Temporary pavements.

3. Bridge deck approaches.

4. Shoulders.

5. Tapers.

6. Turning lanes.

7. Driveways.

8. Areas with low overhead clearances.

(b) Equipment. When using MTV, install minimum 10-ton-capacity hopper insert in conventional paver hopper. Provide the following equipment:

1. High-capacity truck unloading system in MTV capable of receiving HMA from hauling equipment.

2. MTV storage bin with minimum 15-ton capacity.

3. An auger mixing system in one of the following: the MTV storage bin, or paver hopper insert, or paver hopper to continuously mix HMA prior to discharging to

the paver's conveyor system.

Avoid stop-and-go operations by coordinating plant production rate, number of haul units, and MTV and paver speeds to provide a continuous, uniform, segregation-free material flow and smooth HMA pavement. Maintain uniform paver speed to produce smooth pavements.

(c) Performance Evaluation. Evaluate the performance of MTV and mixing equipment by measuring mat temperature profile immediately behind paver screed on first day of paving and when it feels the need to do so due to perceived changes in performance or as directed by the Engineer.

Use a hand-held temperature device that has been calibrated within the past 12 months. It shall be an infrared temperature gun is capable of measuring in one degree or finer increments between the temperatures of 80 degrees to 400 degrees F with a laser to indicate where the temperature reading is being taken. Six temperature profile measurements shall be taken of mat surface using infrared temperature gun at 50-foot intervals behind paver. Each temperature profile shall consist of three surface temperature measurements taken transversely across the mat in approximately a straight line from screed while paver is operating. For each profile, temperatures shall be measured approximately 1 foot from each edge and in middle of mat. The difference between maximum and minimum temperature measurements for each temperature profile shall not exceed 10 degrees F. If any two or more temperature profiles exceeds the allowable 10-degree F temperature differential, halt paving operation and adjust MTV or mixing equipment to ensure that material placed by paver meets specified temperature requirements. Redo the measuring of mat temperature profile until adjustment of the MTV or mixing equipment is adequate. Submit all temperature profiles to the Engineer by next business day. Information on the report shall show location and temperature readings and time test was performed. Enough information shall be given, so the Engineer will be able to easily locate the test site of the individual measurement.

When requested temperature profile measurements shall be done in the presence of the Engineer.

Once adjustments are made, repeat measurement procedure for the next two placements to verify that material placed by paver meets specified temperature requirements.

Terminate paving if temperature profile requirements are not met during repeated measurement procedure. If equipment fails to meet requirements after measurement procedure is repeated once, replace equipment before conducting any further temperature profile measurements

The Engineer may perform surface temperature profile measurements at any time during project. The Engineer may in lieu of a hand-held infrared temperature device use an infrared camera or device that is capable of measuring temperatures to locate cold spots. If such cold spots exist, the Engineer may require adjustments to the MTV.

If bleeding or fat spots occur in the pavement adjust means and methods to eliminate such pavement defects and perform remedial repair to pavement acceptable to the Engineer. Bleeding is defined as excess binder occurring on the surface of the pavement. It may create a shiny, glass-like, reflective appearance and may be tacky to the touch. Fat spots are localized bleeding.

(d) Transport.

1. Trailered MTV. Transport MTV by means of truck-tractor/trailer combination in accordance with Chapter 104 of Title 19, Department of Transportation, entitled "The Movement by Permit of Oversize and Overweight Vehicles on State Highways".

2. Crossing Bridges for Self-Powered MTV. When self-powered MTV exceeds legal axle or total weight limits for vehicles under the HRS, Chapter 291, conform to the following when crossing bridges within project limits unless otherwise indicated:

a. Completely remove mix from MTV.

b. Move MTV at relatively constant speed not exceeding 5 miles per hour. MTV will not be allowed to stop on bridge.

c. No other vehicle or equipment will be allowed on bridge.

d. The MTV shall not attempt to cross a bridge where the posted load limit is less than or

equal to the weight of the MTV empty. Permission to cross the bridge shall be obtained from the Engineer and HWY-DB in writing.

(C) Preparation of Surface. Clean existing pavement in accordance with Section 310 - Brooming Off. Apply tack coat in accordance with Section 407 - Tack Coat. Tack coat shall not be applied to surfaces to receive an application of joint adhesive.

Where indicated, bring irregular surfaces to uniform grade and cross section by furnishing and placing one or more leveling courses of HMA Mix V. Spread leveling course in variable thicknesses to eliminate irregularities in existing surface. Place leveling course such that maximum depth of each course, when thoroughly compacted to the Contract Documents' requirements, does not exceed 3 inches.

In multiple-lift leveling course construction, spread subsequent lifts beyond edges of previously spread lifts in accordance with procedures contained in current edition of the Asphalt Institute's *Construction of Hot Mix Asphalt Pavements,* Manual Series No. 22 (MS-22) for leveling wedges.

Notify the Engineer of existing surfaces that may not be in a condition that will have enough strength to be a good bonding surface or foundation and should be removed or have remedial repairs done before new pavement placement.

(D) Plant Operation.

(1) Preparation of Asphalt Binder. Uniformly heat asphalt binder and provide continuous supply of heated asphalt cement from storage to mixer. Do not heat asphalt binder above the recommendation of the supplier for modified binders or above 350 degrees F for neat binders.

(2) Preparation of Aggregate. Dry and heat aggregate material at temperature sufficient to produce design temperature of job-mix formula. Do not exceed 350 degrees F. Adjust heat source used for drying and heating to avoid damage to and contamination of aggregate. When dry, aggregate shall not contain more than 1 percent moisture by weight.

For batch plants, screen aggregates immediately after heating and drying into three or more fractions. Convey aggregates into separate compartments ready for batching and mixing with asphalt binder.

(3) Mixing. Measure aggregate and asphalt; or aggregate, RAP, and asphalt into mixer in accordance with an accepted job-mix formula. Mix until components are completely mixed and adequately coated with asphalt binder in accordance with AASHTO M 156. Percent of coated particles shall be 95 percent when tested in accordance with AASHTO T 195.

(4) Plant Inspection. For control and acceptance testing during periods of production, provide a testing laboratory that meets the requirements of AASHTO M 156. Provide space, utilities, and equipment required for performing specified tests.

(E) Spreading and Finishing. Prior to each day's paving operation, check screed or strike-off assembly surface with straight edge to ensure straight alignment and there is no damage or wear to the machine that will affect performance. Provide screed or strike-off assembly that produces finished surface without tearing, shoving, and gouging HMA. Discontinue using spreading equipment that leaves ridges, indentations, or other marks, or combination thereof in surface that cannot be eliminated by rolling or affects the final smoothness of the pavement or be prevented by adjustment in operation.

Maintain HMA at minimum 250 degrees F temperature at discharge to paver. The Engineer shall observe the contractor measuring the temperature of mix in hauling vehicle just before depositing into spreader or paver or MTV.

Deposit HMA in a manner that minimizes segregation. Raise truck beds with tailgates closed before discharging HMA.

Lay, spread, and strike off HMA upon prepared surface. Where practical, use asphalt pavers to distribute mixture.

Where practical, control horizontal alignment using automatic grade and slope controls from reference line, slope control device. Existing pavements or features shall not be used for grade control alone.

Obtain sensor grade reference, horizontal alignment by using established grade and slope controls. For subsequent passes, substitution of one ski with joint-matching shoe riding on finished adjacent pavement is acceptable. Use of a comparable non-contact mobile reference system and joint matching shoe is acceptable.

Avoid stop-and-go operation. Maintain a constant forward speed of paver during paving operation and minimize other methods that impact smoothness.

Offset longitudinal joint in successive lifts by approximately 6 inches. Incorporate into paving method an overlap of material of 1-inch +/- 0.5 inches at the longitudinal joint. The HMA overlap material shall be left alone when initially placed and shall not be bumped back or pushed back with a lute or any other hand-held device. If the overlap exceeds the maximum amount, remove the excess with a flat shovel, allowing recommended amount of overlap HMA material to remain in place to be compacted. Do not throw the removed excess HMA material on to the paving mat. The longitudinal joint in a surface course when total roadway width is comprised of two lanes shall be near the centerline of pavement or near lane lines when roadway is more than two lanes in width. The longitudinal joint shall not be constructed in the wheel path or under the longitudinal lane lines. Make a paving plan drawing showing how the longitudinal joint will not be located in these areas.

Control the horizontal alignment of the longitudinal edge of the HMA mat being installed so that the edge is parallel to the centerline or has a uniform alignment, e.g., the edge of the mat is straight line or uniform curve, no wavy edge, etc. to have a consistent amount of HMA material at the joint.

Check the compaction of the longitudinal joint during paving often enough to ensure that it will meet the compaction requirements.

If nuclear gauges and ground penetrating radar are used as the contractor's quality control method, they shall be properly calibrated and periodically checked by comparison to cores taken from the pavement. The use of sand as an aid in properly seating the gauge may also be considered for improving the accuracy of the gauge.

In areas where irregularities or unavoidable obstacles make use of mechanical spreading and finishing equipment impracticable, spread, rake, and lute mixture by hand tools. For such areas, deposit, spread evenly, and screed mixture to required compacted thickness.

Demonstrate competence of personnel operating grade and crown control device before placing surface courses. If automatic control system becomes inoperative during the day's work, the Engineer will permit the Contractor to finish day's work using manual controls. The Engineer may also allow additional HMA to be ordered and placed using manual controls if it will provide a safer work site for the public to travel through. Do not resume work until automatic control system is made operative. The Engineer may waive requirement for electronic screed control device when paving gores, shoulders, transitions, and miscellaneous reconstruction areas where the use of the devices is not practical.

When production of HMA can be maintained and when practicable, use pavers in echelon shall be used to place surface course in adjacent lanes.

At the end of each workday, HMA pavement that is open to traffic shall not extend beyond the panel of the adjacent new lane pavement by more than the distance normally placed in one workday. At end of each day's production, construct tapered transitions along all longitudinal and transverse pavement drop-offs; this shall apply to areas where existing pavement is to meet newly placed pavement. Use slopes of 6:1 for longitudinal taper transitions and 48:1 for transverse tapered transitions. Maximum drop-off height along the joints shall be 3 inches. Also, using a 48:1 slope provides a taper around any protruding object, e.g., manholes, drain boxes, survey monuments, inlets, etc., that may be above pavement surface when opened to the public. If the object is below the surface of the pavement then fill the depression until it is level with the surrounding pavement or raise depressed objects to the finish grade of the placed pavement. Remove and dispose of all transition tapers before placing adjoining panel or next layer of HMA. Notify traveling public of pavement drop-offs or raised objects with signs placed in every direction of traffic that may use and encounter pavement drop-offs or protruding objects or holes.

Use the same taper rates for areas where there is a difference in elevation due to construction work.

At end of each workweek, complete full width of the roadway's pavement, including shoulders, to same elevation with no drop-offs.

(F) Compaction. Immediately after spreading and striking off HMA and adjusting surface irregularities, uniformly compact mixture by rolling.

Initiate compaction at highest mix temperature allowing compaction without excessive horizontal movement. Temperature shall not be less than 220 degrees F.

Finish rolling using tandem roller while HMA temperature is at or above 175 degrees F.

On superelevated curves, begin rolling at lower edge and progress to higher edge by overlapping of longitudinal trips parallel to centerline.

If necessary, repair damage immediately using rakes and fresh mix. Do not displace line and grade of HMA edges during rolling.

Keep roller wheels properly moistened with water or water mixed

with small quantities of detergent. Use of excess liquid, diesel, and petroleum-based liquids will not be allowed on rollers.

Along forms, curbs, headers, walls and other places not accessible to rollers, compact mixture with hot hand tampers, smoothing irons, or mechanical tampers. On depressed areas, trench roller or cleated compression strips under roller may be used to transmit compression.

Before the start of compaction or during compaction or both remove pavement that is loose, broken, or contaminated, or combination thereof; pavement that shows an excess or deficiency in asphalt binder content; and pavement that is defective in any way. Replace with fresh HMA pavement of same type, and compact. Remove and replace defective pavement and compact at no increase in contract price or contract time.

Operate rollers at slow and uniform speed with no sudden stops. The drive wheels shall be nearest to the paver. Continue rolling to attain specified density and until roller marks are eliminated.

Rollers shall not be parked on the pavement placed that day or shift.

(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.

Place HMA pavement in individual lifts that are within minimum and maximum allowable compacted thickness for various types of mixture as specified in Table 401.02-1 - Limits of Compacted Lift Thickness and Asphalt Content.

(2) HMA Pavement Courses Less Than One and a Half Inches Thick. Where HMA pavement compacted thickness indicated in the contract documents is less than 1-1/2 inches, compaction to a specified density will not be required.

Use only non-vibratory, steel-tired, tandem roller. Roll entire surface with minimum of two roller passes. A roller pass is defined as one trip of the roller in one direction over any one spot.

For intermediate rolling, roll entire surface with minimum of four passes of roller.

Finish rolling using steel-tired, tandem roller. Continue rolling until entire surface has been compacted with minimum of three passes of roller, and roller marks have been eliminated.

Do not use rollers that will excessively crush aggregate.

(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 than 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. Paved shoulders shall be compacted in the same manner as pavements designed for vehicular traffic.

(G) Joints, Trimming Edges and Utility Marking. At HMA pavement connections to existing pavements, make joints vertical to depth of new pavement. Saw cut existing pavement and cold plane in accordance with Section 415 - Cold Planing of Existing Pavement to depth equal to thickness of surface course or as indicated in the Contract Documents.

At HMA connections to previously placed lifts, form transverse joints by cutting back on previous run to expose full depth of course. Dispose of material trimmed from edges. Protect end of freshly laid mixture from rollers.

Before and after paving, identify and mark location of existing utility manholes, valves, and handholes on finished surface. Adjust existing frames and covers and valve boxes to final pavement finish grade in accordance with Section 604 - Manholes, Inlets and Catch Basins and Section 626 - Manholes and Valve Boxes for Water and Sewer Systems.

(1) Longitudinal joints. Submit for review the means and methods that will be used to install longitudinal joints at the required compaction and density. Compact longitudinal joints to be not less than 91.0 percent of the maximum specific gravity determined in accordance with AASHTO T 209, modified by deletion of Supplemental Procedure for Mixtures Containing Porous Aggregate. Verify the compaction of the longitudinal joints meets requirements by using non-destructive testing methods during paving and submit the results on the daily quality control test reports.

Test for compaction and density regardless of layer thickness. Compaction and density of the longitudinal joint shall be determined by

using six-inch diameter cores. For longitudinal joints made using butt joints cores shall be taken over the joint with half of the core being on each side of the joint. For longitudinal joints using butt wedge joints, center core over the center of the wedge so that 50 percent of the material is from the most recently paved material and the remaining 50 percent of the core is from the material used to pave the previous layer. One core shall be taken at a maximum of every 250 tons of longitudinal joint and any fraction of that length for each day of paving with a minimum of one core taken for each longitudinal joint per day. Cores taken for the testing of the longitudinal joint may be used to determine pavement thickness.

When the longitudinal joints are found to have less than 91.0 percent of the maximum specific gravity, overband all longitudinal joints within the entire lot represented by the non-compliant core, PG binder seal coat, or other type of joint enrichment accepted by the Engineer. The overband shall not decrease the skid resistance of the pavement under any ambient weather condition. Submit overband material's catalog cuts, test results and application procedure for review and acceptance by the Engineer before use. Center the overband over the longitudinal joint. The overband shall be placed in a uniform width and horizontal alignment. The overband shall have no holidays or streaking in its placement. The width of the overband shall be based on how the longitudinal joint was constructed or as directed by the Engineer. If a butt joint is used, the overband width shall be a minimum of 12-inches. For butt wedge or wedge joints the overband width shall be the width of the wedge plus an additional six-inches minimum. Replace any pavement markings damaged or soiled by the overband remedial repair process.

For longitudinal joints that have a compaction of less than 89 percent of the maximum specific gravity; removal may be required by the Engineer instead of overbanding the non-compliant joint.

Persistent low compaction results may be cause to suspend work and remove non-conforming work. During the suspension of paving, revise means and methods used in constructing longitudinal joints and submit to the Engineer for review and acceptance. Suspension may occur when:

(1) Two or more longitudinal joints tests fail to meet the minimum compaction

(2) One sample reveals that the joint compaction is 89 percent or less.

Compaction results for longitudinal joints until January 1, 2023 will not be included in any Sliding Scale Pay Factor for Compaction payment calculation. After, January 1, 2023 it will be included.

(H) HMA Pavement Samples. Obtain test samples from compacted HMA pavement within 72 hours of lay down. Provide minimum 4-inch diameter cores consisting of undisturbed, full-depth portion of compacted mixture taken at locations designated by the Engineer in accordance with the "Sampling and Testing Guide for Acceptance and Verification" in Hawaii DOT Highways Division, *Quality Assurance Manual for Materials*, Appendix 3. Cores shall be taken in the presence of the Engineer. Turn cores over to Engineer immediately after cores have been taken.

For pavement samples for longitudinal joints provide 6-inch diameter cores minimum. For pavement samples for other than longitudinal joints 4-inch diameter cores minimum shall be taken. All cores shall consist of undisturbed, full-depth of the lift of the compacted mixture taken at locations designated by the Engineer in accordance with the "Sampling and Testing Guide for Acceptance and Verification" in Hawaii DOT Highways Division, *Quality Assurance Manual for Materials*, appendix 3. Coring of longitudinal joints shall use a modified HDOT Sampling and Testing Guide as required by the Contract Documents.

Cores that separate shall indicate to the Engineer that there is insufficient bonding of layers. Modify the previously used paving means and methods to prevent future debonding of layers. Debonding of a core sample after adjustment of the Contractor's methods will be an indication of continued non-conforming work and the Engineer may direct removal of the layer at no additional cost or contract time.

Restore HMA pavement immediately after obtaining samples. Clean core hole and walls of all deleterious material that will prevent the complete filling of the core hole and the bonding of the new HMA to the existing. Apply tack coat to vertical faces of sample holes. Fill sampled area with new HMA pavement of same type as that removed. If hand compaction is used; fill in layers not exceeding the minimum thickness stated in Table 401.02-1 - Limits of Compacted Lift Thickness And Asphalt Content. Compact each layer to compaction requirements. If Mechanical Compaction methods are used, then layers may be the maximum layer thickness stated in Table 401.02-1 - Limits of Compacted Lift Thickness And Asphalt Content. Using tires or hand tamping to compact the HMA material to restore the pavement shall not be considered as mechanical compaction.

Only sample and test leveling course if 1-1/2 inches or greater. No compaction requirements for less than 1-1/2 inches.

(I) HMA Pavement Thickness Tolerances.

The Engineer will measure thickness of pavement by cores obtained by the Contractor in accordance with HDOT TM 09-19 Field Sampling

Bituminous Material after Compaction (Obtaining Cores). The Engineer will measure cores in accordance with HDOT TM 09-19, except that measurement will be taken to nearest one thousandth of an inch; and average of such measurements will be taken to nearest one hundredth of an inch.

Thickness of finished HMA pavement shall be within 0.25 inch of thickness indicated in the Contract Documents. Pavement not meeting the thickness requirements of the Contract Documents may be required by the Engineer to be removed and replaced.

Corrective methods taken on pavement exceeding specified tolerances, e.g., insufficient thickness by methods accepted by the Engineer, including removal and replacement, shall be at no increase in contract price or contract time.

The checking of pavement thickness shall be done after all remedial repairs, e.g., smoothness compliance repairs, compaction, have been completed, reviewed, and accepted by the Engineer.

(J) Quality Control Using New Technology. The Engineer and MTRB reserves the right to utilize new technology and methods to improve the detection of noncompliant work on the project. The technology or method may be used to locate defects in the work, e.g., ground penetrating radar to locate delaminations, moisture damage, thin sections, voids, non-compliant compaction, other non-destructive testing to locate flaws. The defect will be verified by the methods stated in the Contract Documents or by other established conventional means. If the technology or method has already been accepted elsewhere or has standardized testing procedures the results may be judged acceptable by the Engineer and no further testing will be required. These new technologies and methods may be used for the selection of sampling locations.

(K) Protection of HMA Pavement. Except for construction equipment directly connected with paving operations, keep traffic off HMA pavement.

Protect HMA pavement from damage until it has cooled and set.

Do not refuel equipment or clean equipment or hand tools over paved surfaces unless catch pan or device that will contain spilled fuel and other products is provided. After completion of refueling or cleaning, remove catch pan or device without spilling any of the collected content.

Do not park roller or other paving equipment on HMA pavement paved within 24 hours of laydown.

(L) Pavement Joint Adhesive

(1) **Pavement Joint Adhesive on Joints**. Use on all asphalt pavement construction where joints are formed at such locations but not limited to the following:

(a) Adjacent asphalt pavements, e.g., trafficked lanes, shoulders, etc.

(b) Asphalt pavement and adjacent concrete pavement or curb and gutter or any other surface where the bonding of the asphalt pavement and concrete surface is desired,

(c) Transverse joints between asphalt pavements not placed at the same time or if the pavement's temperature on one side of the joint is below the minimum temperature the mix can be at, during asphalt pavement compaction or installation.

(d) Cut face of an existing pavement where it will have new HMA pavement placed against it, e.g., utility trenches, partial or full depth repairs, etc.

Pavement joint adhesive is not required on a longitudinal construction joint between adjacent hot mix asphalt pavements formed by echelon paving. Echelon paving is defined as paving multiple lanes side-by-side with adjacent pavers slightly offset at the same time.

A longitudinal construction joint between one shift's work and another shall have pavement joint adhesive applied at the joint. Any longitudinal construction joint formed, with the temperature on one side of the joint that is below the minimum temperature the mix can be when compacted to contract requirements during asphalt pavement installation, shall have pavement joint adhesive applied at the joint.

(2) **Material requirements**. Asphalt joint adhesive shall meet requirements as specified in Table 401.03-1 - Asphalt Joint Adhesive Specifications.

TABLE 401.03-1 – ASPHALT JOINT ADHESIVE SPECIFICATIONS		
TEST		**SPECIFICATION**
Brookfield Viscosity, 204 °C [400 °F]	ASTM D 3236	4,000-10,000 cp
Cone Penetration, 25 °C [77 °F]	ASTM D 5329	60-100 dmm
Resilience, 25 °C [77 °F]	ASTM D 5329	30% minimum
Ductility, 25 °C [77 °F]	ASTM D 113	30 cm minimum
Ductility, 4 °C [39.2 °F]	ASTM D 113	30 cm minimum
Tensile Adhesion, 25 °C [77 °F]	ASTM D 5329	500% minimum
Softening Point	ASTM D 36	77 °C [170 °F] min.
Asphalt Compatibility	ASTM D 5329	Pass

(3) Construction Requirements for Asphalt Joint Adhesive

(a) Equipment Requirements. Use a jacketed double boiler type melting unit, with both agitation and recirculation systems. Provide a pressure feed wand application system.

(b) Material Handling. Submit a copy of the manufacturer's recommendations for heating, re-heating, and applying the joint adhesive material. Follow manufacturer's recommendations. Do not remove the joint adhesive from the package until immediately before it is placed in the melter. Joint adhesive boxes must be clearly marked with the name of the manufacturer, the trade name of the adhesive, the manufacturer's batch and lot number, the application/pour temperature, and the safe heating temperature. Feed additional material into the melter at a rate equal to the rate of material used.

Verify the pouring temperature of the joint adhesive at least once per hour at the point of discharge. Stop production if the adhesive falls below the recommended application/pour temperature. When the temperature of the adhesive exceeds the maximum safe heating temperature, stop production, empty the melter, and dispose of that adhesive in an environmentally safe method. No payment will be made for this material or its disposal.

Do not blend or mix different manufacturer’s brands or different types of adhesives.

(c) Joint Adhesive Application: The face of the joint that

the new asphalt pavement will bind to shall be clean and dry before the joint adhesive is applied. Apply the pavement joint adhesive material to the entire face of the surface where HMA pavement shall be installed. The thickness of the asphalt adhesive application shall be approximately 1/8 inch. Use an application shoe attached to the end of application wand. Do not overlap the joint by greater than 1/2-inch at the top of the joint or two-inches at the bottom of the joint. Apply the joint adhesive immediately in front of the paving operation. If the adhesive is tracked by construction vehicles, repair the damaged area, and restrict traffic from driving on the adhesive.

(d) Field Sampling. Take a sample from the application wand during the first 20 minutes of placing sealant. One sample should be taken per manufacturer's batch or minimum of every 6 months on the Project in the presence of the Engineer.

Each sample shall consist of one quart in an aluminum or steel sample container. The sampling container shall be labeled with Contractor's name; project name and number; date and time sample taken; location of where material was used at, e.g., from where to where it was used at in stations; manufacturer and lot number of the sealant. Turn over samples to Engineer without Engineer losing sight of the sample. The Engineer reserves the right to conduct supplementary sampling and testing of the sealant material.

(M) Pavement Smoothness Rideability Test. Perform surface profile tests frequently to ensure that the means and methods being used produces pavement that is compliant with the surface profile smoothness requirement. Test the pavement surface for smoothness with High-Speed Inertial Profiler to determine the International Roughness Index (IRI) of the pavement. For the locations determined by the Engineer, a 10-foot straightedge shall be used to measure smoothness.

All smoothness testing must be performed with the presence of the Engineer. The High-Speed Inertial Profiler operator shall be a certified operator by MTRB or the manufacturer.

The High-Speed Inertial Profiler operator's certification shall be no older than five years old at the date of the Notice to Proceed and at the day of the pavement profile measurement.

The finished pavement shall comply to all the following requirements:

(a) Smoothness Test using 10-Foot Straightedge (Manual or rolling) The 10-foot straightedge is used to identify the locations that vary more than 3/16 inch from the lower edge when the 10-foot straightedge is laid on finished pavement on the direction parallel with the centerline or perpendicular to centerline. Remove the high points that cause the surface to exceed that 3/16 inch tolerance by grinding.

The Contractor shall use a 10-foot straightedge for the following locations:

1. Longitudinal profiling parallel to centerline, when within 15 feet of a bridge approach or existing pavement which is being joined.

2. Transverse profiling of cross slopes, approaches, and as otherwise directed. Lay the straightedge in a direction perpendicular to the centerline.

3. When pavement abuts bridge approaches or pavement not under this Contract, ensure that the longitudinal slope deviations of the finished pavement comply with Contract Document's requirements.

4. Short pavement sections up to 600 feet long, including both mainline and non-mainline sections on tangent sections and on horizontal curves with a centerline radius of curve less than 1,000 feet.

5. Within a superelevation transition on horizontal curves having centerline curve radius less than 1,000 feet, e.g., curves, turn lanes, ramps, tapers, and other non-mainline pavements.

6. Within 15 feet of transverse joint that separates pavement from existing pavement not constructed under the contract, or from bridge deck or approach slab for longitudinal profiling.

7. At miscellaneous areas of improvement where width is less than 11 feet, such as medians, gore areas, and shoulders.

8. As otherwise directed by the Engineer. The Engineer may confine the checking of through traffic lanes with the

straightedge to joints and obvious irregularities or choose to use it at locations not specifically stated in this Section.

(b) High-Speed Inertial Profiler

There shall be a minimum 3 profile runs per lane, for each wheel path (left and right) which is approximately three feet from edge lane line. The segment length shall be 0.1 mi. The final segments in a lane that are less than 0.1 mi shall be evaluated as an independent segment and pay adjustments will be prorated for length. The profiles shall be taken in the direction of traffic only.

The latest version of FHWA ProVAL software shall be used to conduct profile analysis to determine IRI and areas of localized roughness. The IRI values shall be reported in units of in/mi.

Areas of localized roughness will be identified by using ProVAL's "Smoothness Assurance" analysis, calculating IRI with a continuous short interval of 25 feet and the 250-mm filter applied.

Additional runs may be required by the Engineer if the data indicate a lack of repeatability of results. A 92% agreement is required for repeatability and IRI values shall have at minimum a 95% confidence level.

(N) Required Pavement Smoothness

The IRI for the left and right wheel paths in an individual lane will be computed and then averaged to determine the Mean Roughness Index (MRI) values. The MRI will be used to determine acceptance and pay adjustment. Each lane shall be tested and evaluated separately.

There are three (3) categories of target MRI values:

TABLE 401.03-2 – PAVEMENT SMOOTHNESS CATEGORIES

Category	Description	MRI
Type A	Three or more HMA Lifts	Shall not exceed 60 in/mi
Type B	Two HMA Lifts	Shall not exceed 70 in/mi
Type C	One HMA Lift	Shall not exceed 75 in/mi

For the location where a 10-foot manual straightedge is required, the surface shall not vary more than 3/16 inch from the lower edge of a straightedge.

No pre-final inspection, final inspection, and substantial completion granted will be made until the pavement meets smoothness requirement and all required profile reports are submitted to the Engineer and MTRB and are accepted.

(O) Request for Profile Testing by the Department.

For Type C, prior to pavement activities, the Engineer will measure the smoothness of the existing pavement.

The Contractor shall submit a written request to the Engineer to perform all required profile tests.

The request shall be made at least 30 days before desired testing date and shall include an approximate acceptance profile testing date, a plan view drawing of the area to be tested with the limits of the test area highlighted.

The Contractor shall reimburse HDOT for any incurred cost related to any Contractor-caused cancellation or a deduction to the monthly payment will be made.

(P) Department Requirements for Profile Testing. When a request for testing is made, the requested area to be tested shall be 100% of the total area indicated to be paved in the Contract Documents unless the requirement is waived by the Engineer and MTRB.

Department acceptance surface tests will not be performed earlier than 14 days after HMA placement.

Clean debris and clear obstructions from area to be tested, as well as a minimum of 100 feet before and beyond the area to be tested before testing starts for use as staging areas. Provide traffic control for all profile testing.

The Engineer or MTRB or both may cancel the profile testing if the test area is not sufficiently clean, traffic control is unsatisfactory, or the area is not a safe work environment or test area does not meet Contract Document requirements. This canceled profile test will count as one profile test.

(Q) Cost of Acceptance Profile Testing by The Department. The Engineer, MTRB, or State's Third-Party Consultant will perform one initial profile test, at no cost to the Contractor for each area to be tested.

The Department's High-Speed Inertial Profiler pavement profile will be used to determine if the pavement's profile, i.e., smoothness is acceptable.

If the profile of the pavement does not meet the requirements of the Contract Documents, the Contractor shall perform remedial work, i.e. corrective work then retest the area to ensure that the area has the required MRI, i.e., smoothness, before requesting another profile test by the Engineer.

(1) Additional testing. Additional testing, by the Department beyond the initial test will be performed at cost to the Contractor as follows:

(a) $2,500 per test will be required when Department personnel or State's Third-Party Consultant is used.

(R) Remedial Work for Pavements.

(1) Corrective work shall be required for any 25 ft interval with a localized roughness in excess of 160 in/ mi. The Engineer may waive localized roughness requirements for deficiencies resulting from manholes or other similar appurtenances. Adjust manholes or other similar appurtenances so that using a 10-ft. straightedge the area around that manhole or other similar appurtenance shall not have more than 3/16-in. variation between any 2 contacts on the straightedge.

If corrective action is not successful, the Engineer may require continued corrective action, or apply a payment adjustment of $250 per occurrence.

(2) Corrective work shall also be required for any 0.1 mile interval with an average MRI above 95.0 in/mi for Types A and B. For Type A, correct the deficient section to an MRI of 60 in/mi or less. For Type B, correct the deficient section to an MRI of 70 in/mi or less. For Type C, corrective work may be required by the Engineer for 0.1 mile intervals that have an average MRI above the threshold shown in Tables 401.03-4 – Smoothness Pay Disincentives with MRI and 401.03-5 – Smoothness Pay Disincentives for Percent Improvement as applicable.

If corrective action does not produce the required improvement, the Engineer may require continued corrective action, or apply payment adjustment as shown in Tables 401.03-4 – Smoothness Pay

Disincentives with MRI and 410.03-5 – Smoothness Pay Disincentives for Percent Improvement.

(3) The Contractor shall notify the Engineer at least 24 hours prior to commencement of the corrective work. The Contractor shall not commence corrective work until the methods and procedure have been approved in writing by the Engineer.

(4) All smoothness corrective work for areas of localized roughness shall be for the entire lane width. Pavement cross slope shall be maintained through corrective areas.

(5) The remedial repair areas shall be neat, rectangular areas having a uniform surface appearance.

(6) If grinding is used on HMA pavement, the surface shall have nearly invisible grinding marks to passing motorist.

(7) Other methods may include milling and overlaying HMA pavement. The length, depth of the milling and the replacement material will be solely decided by the Engineer.

(8) The finished repaired pavement surface shall leave no ridges or valleys or fins of pavement other than those allowed below.

(9) Remedial repairs shall not leave any drainage structures' inlets higher than the surrounding pavement or alter the Contract Document's drainage pattern.

(10) For items in the pavement other than drainage structures, e.g., manhole frame and covers, survey monuments, expansion joints etc., the finish pavement, ground or not, shall not be more than 1/4 inch in elevation difference. Submit to the Engineer remedial repair method to correct these conditions for acceptance.

(11) Pick up immediately grinding operation residue by using a vacuum attached to grinding machine or other method acceptable to the Engineer.

(a) Any remaining residue shall be picked up before the end of shift or before the area is open to traffic, whichever is earlier.

(b) Prevent residue from flowing across pavement or from being left on pavement surface or both.

(c) Residue shall not be allowed to enter the drainage system.

(d) The residue shall not be allowed to dry or remain on the pavement.

(e) Dispose of all material that is the result of the remedial repair operation, e.g., HMA residue, wastewater, and dust at a legal facility.

(12) Complete corrective work before determining pavement thickness for HMA pavements in accordance with Subsection 401.03(I) – HMA Pavement Thickness Tolerances.

(13) All HMA wearing surface areas that have been ground shall receive a coating, e.g., a coating material that will restore any lost impermeability of the HMA due to the grinding of the surface. The coating used shall not be picked up or tracked by passing vehicles or be degraded after a short period of time has passed, i.e., it shall have a service life equal to or greater than the HMA pavement. The coating shall not decrease the pavement's friction value. The coating's limits shall be the full width of the lane regardless how small. If the remedial repair area extends into the next lane, then the repair area will be full lane width also. Extend the length of coating areas in order for the coating area to look like the rest of the road and does not have patches on it, i.e., make the road look uniform in color. The coating shall be of a color that matches the surrounding pavement. The areas receiving the coating shall not be open to traffic until it has cured enough so that it cannot be picked up or tracked by passing vehicles or degrade. Submit means and methods of the coating and type of coating to the Engineer or MTRB for review and acceptance. Do not proceed with the coating without acceptance from the Engineer.

(14) Recompacting cold HMA, i.e., HMA that has reached ambient temperature is not an acceptable remedial repair method.

(15) Replace all pavement markings damaged or discolored by remedial repairs.

(16) Reprofile the corrected area and provide the Engineer the results that show the corrective action, i.e., remedial repairs were successful.

(S) Pavement Smoothness and Acceptance.

(1) Price and payment in various paving sections, e.g., 401 (Hot Mix Asphalt Pavement), shall be full compensation for all work and materials specified in the various paving sections and this section, including but not limited to furnishing all labor, materials, tools, equipment, testing, incidentals and for doing all work involved in micro milling, milling (cold planing), grinding existing or new pavement, removing residue, cleaning the pavement, necessary disposal of residue, furnishing of any water or air used in cleaning the pavement and any other related ancillary work or material or services. Also, it includes any remedial work, e.g., re-paving, surface grinding, application of a coating, curing compound, and replacement of damaged pavement markings.

(2) The contract price in those sections may be adjusted for pavement smoothness by the Engineer. The pavement smoothness contract unit price adjustments and work acceptance will be made in accordance with the following schedules.

TABLE 401.03-3 –SMOOTHNESS PAY INCENTIVES		
Category	**MRI (in/mi)**	**Pay Adjustment $ per 0.1 mi**
Type A (Three or more HMA Lifts)	<30.0	$580
	30.0- less than 35.0	$480
	35.0- less than 40.0	$380
	40.0- less than 45.0	$280
	45.0- less than 50.0	$180
	50.0- less than 55.0	$80
	55.0- less than 60.0	$0
Type B (Two HMA Lifts)	<35.0	$420
	35.0- less than 40.0	$360
	40.0- less than 45.0	$300
	45.0- less than 50.0	$240
	50.0- less than 55.0	$180
	55.0- less than 60.0	$120
	60.0- less than 65.0	$60
	65.0- less than 70.0	$0
Type C (One HMA Lift)	<40.0	$280
	40.0- less than 45.0	$240
	45.0- less than 50.0	$200
	50.0- less than 55.0	$160
	55.0- less than 60.0	$120
	60.0- less than 65.0	$80
	65.0- less than 70.0	$40
	70.0- less than 75.0	$0

(3) Pay Pavement Smoothness Adjustment will be based on the initial measured MRI for both left and right wheel path, prior to any corrective work for the 0.10-mile section, except for sections that the Contractor has chosen to remove and replace. For sections that are replaced, assessments will be based on the MRI determined after replacement.

(a) The Pavement Smoothness Adjustment will be computed using the plan surface area of pavement shown in the Contract Documents. This Pavement Smoothness Adjustment will apply to the total area of the 0.10-mile section for the lane width represented by MRI for the same lane. It does not include any other price adjustments specified in the Contract Documents. Those price adjustments will be, for each adjustment, calculated separately using the original contract price to determine the amount of adjustment to be made to the contract price. Sections shorter than 0.1 mile and longer than 50 feet shall be prorated.

(b) For 0.1 mile intervals with an average MRI above the threshold shown in Table 401.03-3 – Smoothness Pay Incentives, the Engineer shall apply a disincentive payment adjustment up to the limit shown.

i. For Types A and B, payment adjustments shall be applied up to an MRI of 95.0 per Table 401.03-4 – Smoothness Pay Disincentives with MRI.

ii. For Type C, the payment adjustment shall be dependent on the average MRI of the pavement prior to paving activities
    1. If the MRI of the pavement prior to paving activities is 125.0 in/mi or less, the payment adjustment shall be per Table 401.03-4– Smoothness Pay Disincentives with MRI.
    2. If the MRI of the pavement prior to paving activities is more than 125.0 in/mi, the disincentive payment adjustment shall be per Table 401.03-5 – Smoothness Pay Disincentives for Percent Improvement, and based on the percent improvement using the following formula:

% Improvement = (Initial segment MRI – Final segment MRI) x 100 / (Initial Segment MRI)

TABLE 401.03-4 –SMOOTHNESS PAY DISINCENTIVES WITH MRI		
Category	**MRI (in/mi)**	**Pay Adjustment $ per 0.1 mi**
Type A (Three or more HMA Lifts)	60.0- less than 70.0	-$100
	70.0- less than 75.0	-$250
	75.0- less than 80.0	-$350
	80.0- less than 85.0	-$450
	85.0- less than 95.0	-$550
	> 95.0	Corrective Work
Type B (Two HMA Lifts)	70.0- less than 75.0	-$100
	75.0- less than 80.0	-$200
	80.0- less than 85.0	-$300
	85.0- less than 95.0	-$400
	> 95.0	Corrective Work
Type C (One HMA Lift) (pre-paving MRI < 125)	75.0- less than 80.0	-$50
	80.0- less than 85.0	-$100
	85.0- less than 90.0	-$150
	90.0- less than 100.0	-$200
	>100.0	-$250

TABLE 401.03-5 –SMOOTHNESS PAY DISINCENTIVES FOR PERCENT IMPROVEMENT		
Category	**Percent Improvement %**	**Pay Adjustment $ per 0.1 mi**
Type C (One HMA Lift) (pre-paving MRI > 125)	≥ 40	$0
	20.0- less than 40.0	-$100
	< 20	-$200

(c) Incentives will not apply to areas where payment deductions or remedial repairs has been made for non-compliant work, e.g., low compaction, thin pavement, thermal segregation, low compressive or flexural strength, non-compliant alignment. Incentives will also not apply to areas where corrective work was required to meet contract

smoothness requirements, unless the pavement section was replaced. All areas where corrective work was performed shall be tested again to ensure the smoothness requirements are met.

(d) There will be no incentive price adjustments to the contract prices regardless of the pavement meeting the Contract Documents' requirements for incentive contract price adjustment, when 25% of the total area paved of that particular type of pavement on the project has failed to meet any of the Contract document requirements, e.g., smoothness, thickness, unit weight, asphalt content, pavement defects, compaction, flexural or compressive strength. Areas exempt from the smoothness requirements may not be included in the total area calculation unless it is non-compliant.

(e) For contracts using lump sum the method described in Subsection 104.06 Methods of Price Adjustment paragraph (3), will be used to calculated proportionate unit price, i.e., the Engineer's calculated theoretical unit price. This calculated proportionate unit price will be used to calculate the unit price adjustment.

401.04 Measurement.

(A) The Engineer will measure HMA pavement per ton in accordance with the Contract Documents.

(B) The Engineer will measure leveling course and HMA pavement overlay per ton in accordance with the Contract Documents.

(C) Engineer will measure additional State pavement profiling work when applicable on a cost-plus basis as specified in this section and as ordered by Engineer. The Engineer will issue a billing for the pavement profile work done for the time period with the invoices and receipts that the billing was based on attached to the Contractor for each contract item. The Contractor's pavement profile work required in this section will not be measured and will be considered incidental to the various paving items unless stated otherwise.

401.05 Payment. The Engineer will pay for the accepted PMA pavement 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.

(A) Price and payment in Section 401 – HMA Pavement will be full compensation for all work and materials specified in this Section including furnishing all labor, materials, tools, equipment, testing, pavement profiles and incidentals and for doing all work involved in grinding existing or new pavement, removing residue, and cleaning the pavement, including necessary disposal of residue and furnishing any water or air used in cleaning the pavement and remedial work needed to conform to the requirements of the Contract Documents.

(B) No payment for the Contractor's pavement profile work required in this section will be made. The Contractor's pavement profile work shall be considered incidental to the various paving items unless stated otherwise.

(C) Engineer will pay or deduct for the following pay items when included in proposal schedule:

Pay Item	**Pay Unit**
Pavement Smoothness Incentive	Allowance
_____ PMA Pavement, Mix No. _____	Ton

(1) 70% of the contract unit price or the theoretical calculated 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.

(2) 20% of the contract unit price or the theoretical calculated 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 compaction acceptance. Maintain temporary pavement markings and other temporary work zone items, maintain a clean work site.

(3) 10% of the contract unit price or calculate the unit price when the final configuration of the pavement markings is in place.

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. Adjustments for existing street survey monument frames and covers will be paid for as if each were a valve box frame and cover.

The Engineer may, at his sole discretion, 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, if the Engineer decides to use a sliding scale factor, at a reduced price arrived at by multiplying the contract unit price by the pay factor. The Engineer is not obligated to allow non-compliant work to remain in place and may at any time chose not to use a sliding scale factor method of payment and instead require removal of the noncompliant pavement that is greater than 97.0 or less than 93.0.

In compliance with Subsection 105.12 Removal of Non-Conforming and Unauthorized Work remove and replace HMA compacted below 90.0 percent.

The Engineer will solely decide if the noncompliant work would be acceptable if a reduced payment for the noncompliant work is made. The Engineer is not obligated to allow noncompliant work to remain in place and may at any time choose not to use a sliding scale factor method of payment as a method of resolution. Instead, utilize the remedy allowed in Subsection 105.12 Removal of Non-Conforming and Unauthorized Work, requiring removal of the noncompliant pavement, shall be used.

Such a reduced payment, if made and accepted by the Contractor, shall be a mutually agreeable resolution to the noncompliant work being addressed. If it is not mutually acceptable, the noncompliant work shall be removed. If the reduced payment is acceptable; the Engineer will make the reduced payments for the noncompliant work in accordance with Table 401.05-2 - Sliding Scale Pay Factor for Compaction. The amount of tonnage to be reduced will be determined by the Engineer by using the initial cores taken on the mat. No additional cores shall be taken to determine the limits of the non-compliant area unless requested by the Engineer.

The Engineer, for determining the reduced tonnage for noncompliant work, will assume the level of compaction is linear and will proportion the compaction level from the last core that indicated an acceptable compaction level to the nearest core indicating a noncompliant compaction level to determine the calculated limit of acceptable compaction. The length will be the linear distance between the cores measured along the baseline. If there is no core that was taken for the shift's or day's work that were compliant then the limit will be the end or start of the day's or shift's work. The width will be the nominal paving width. Use the day's specific gravity of the mix to determine tonnage. The thickness will be the nominal paving thickness.

The total reduced noncompliant tonnage to be paid will be determined by multiplying the applicable percent of reduction by the computed tonnage of the noncompliant work. Percent of Quantity Paid shall be the percentage shown in Table 401.05-2 - Sliding Scale Pay Factor for Compaction. The reduced tonnage shall be used as the payment quantity for the noncompliant work. The reduced quantity paid that is used for the monthly payment will be arrived at by multiplying the contract unit price by the reduced tonnage.

Table 401.05-2 – Sliding Scale Pay Factor for Compaction	
Percent Compaction	**Percent of Quantity Paid**
> 98.0	Removal
>97.0 - 98.0	95
93.0- 97.0	100
90.0 - <93.0	80
<90.0	Removal

END OF SECTION 401

Amend **Section 411 – PORTLAND CEMENT CONCRETE PAVEMENT** to read as follows:

"SECTION 411 - PORTLAND CEMENT CONCRETE PAVEMENT

411.01 Description. This section describes constructing portland cement concrete (PCC) pavement, with or without reinforcement, on a prepared surface.

411.02 Materials.

Structural Concrete (minimum 12-hour flexural strength, fr = 450 psi.)

Design the concrete to have an air content of 3 percent ±1% and a slump not to exceed 4 inches. When using a non-retarding high range water reducer system, design the concrete with a slump not greater than 6 inches.

Provide flexural strength data and maturity index from trial batches of the proposed mix design. Determine the specimen's maturity index according to ASTM C1074 for test ages of 6, 9, 12, 15, and 24 hours. The Contractor shall furnish material, equipment and services necessary for casting test beams, and shall fabricate, cure and test the beams according to AASHTO T23, AASHTO T97 and ASTM C 1074. Do not allow specimens to be disturbed during the initial curing period. Trial batches, testing and development of the maturity index is considered incidental to concrete pavement.

Structural Concrete (minimum <u>14-day</u> flexural strength, f_r = 650 psi)	601
Joint Filler	705.01
Joint Sealer	705.04
Reinforcing Steel	709.01
Curing Materials	711.01
Macro-Synthetic Fibers for Concrete Reinforcement	719

All concrete must comply with the concrete CO_2 footprint reduction requirements of Section 601.

411.03 Construction.

(A) Paving Plan. Submit the paving plan no later than 30 days after the contract certification date. The paving plan must be complete and provide all information required. No partial submittal, except as noted, will be accepted.

Partial submittals will be returned without review. The Engineer will review the paving plan in accordance with Subsection 105.04 – Review and Acceptance Process. Obtain acceptance of the paving plan from the Engineer before starting the test strip or any paving work including but not limited to any roadway excavation and subbase preparation and installation. The paving plan must include but not be limited to the following:

(1) Type, make, model, and the number of all equipment to be used for placing, finishing, foggers, curing, saw cutting, and diamond grinding of concrete pavement. Include a list of the equipment to be used and the number of equipment to be held in reserve in anticipation of breakdown. Provide the number of finishing bridges that will be used for thickness checking, finishing, and touch-up curing.

(2) Provide details of:

(a) Traffic control, methods to protect the public, workers, and work.

(b) Grade control methods for each operation. If low slump concrete is to be used list the method as to how required grades shall be maintained.

(c) Repair of non-compliant areas

(d) PCC concrete placement, including but not limited to, proposed operational procedures, e.g., subgrade protection, delivery, or pumping, leveling, finishing methods, thickness checking, and texturing equipment. Dowel and tie bar placement method and equipment.

(e) How weather conditions detrimental to the PCC will be addressed. Rain, hot weather, wind, humidity, surface temperatures, etc. must be monitored and addressed. Include the assumed temperature of concrete to be used in the initial calculation of the evaporation rate. Include action plans that are to be used should bad weather conditions, e.g., high wind, rain, high temperature, occur or will occur during pour and under what condition weather conditions must cause a cancellation or delay of the concrete placement.

(f) List make and model of weather monitoring instruments, to be used at the location of concrete placement, to measure the concrete temperature, temperature of surfaces, ambient air temperature, relative humidity, and wind velocity to determine the on-site real-time evaporation rate, and the suitability of surface to have concrete place on it. All-in-one meters that utilize the ACI 305 chart or other accepted methods for determining evaporation rate may be used if found acceptable

by the Engineer.

(g) Make, model, and quantity of foggers to be used and the number of pieces of backup equipment and water source.

(h) Curing. show means and methods, equipment, manufacturer's name, brand name, type of curing materials, and location of use. Method to be used to determine the application rate of the curing compound. The method of continuous agitation is used to keep the uniform distribution of pigment solids in the curing compound. Method to be used to maintain uniform and even paint-like finish spray pattern.

(i) Saw cutting of PCC, list equipment, e.g., what brand and model of early-entry concrete saw will be used, the number of equipment, manpower. How it will be determined when to start cutting, how the proper saw blade will be chosen that will minimize raveling of the concrete during sawing of the joint, and the anticipated joint saw cutting rate.

(j) If applicable diamond grinding and grooving, equipment list, control of slurry, and debris. Slurry and debris pick up, disposal method, and disposal location.

(k) Construction operation sequence and location of panels/blocks and order they will be constructed.

(l) How block-outs for handholes, pull boxes, manhole frames, and covers, drain inlets, etc., in the PCC will be addressed including how the backfill around them will be accomplished and dowel tie bar or reinforcing steel patterns or both.

(m) The saw cutting pattern plan. Indicate the location of areas where panels will be irregular in shape. The size of the plan sheet must be a minimum of 24" X 36". The Engineer may require larger or more detailed plans at no additional cost.

(n) List of ACI Certified Flatwork Finishers and Technicians and a copy of their certification. Refer to Section 411.03(U) Certified Concrete Flatwork Finisher Requirement below.

(o) List of material certifications, submittals, and required reports to be submitted and their tentative submittal schedule.

(p) AASHTO (formally AMRL) material testing laboratory, certified testing, and sampling technicians must be used for all testing and accredited or certified for all test methods used. Submit a list of testing methods to be provided. For each test method to be performed submit certifications of all the technicians that will be performing the test, and the accreditation of the materials

testing laboratory in which the test method is being performed.

If a commercial AASHTO accredited material testing laboratory is not readily available on the island where the work is taking place the Engineer may allow a non-accredited AASHTO material testing laboratory to perform the tests. Provide documentation that an accredited AASHTO material testing laboratory does not exist on the island, due diligence was used in trying to obtain an accredited material testing laboratory. Submit the material testing laboratory's qualifications and test equipment calibration certificate documentation of test equipment that will be used to perform the tests. The Engineer, however, is not under any obligation to grant a waiver from using a non-accredited material testing laboratory, or accept or consider valid any results from a non-accredited testing laboratory or non-certified technician. There will be no waiver granted by the Engineer for the use of non-certified technicians performing material tests, including sampling. The Contractor is required to use due diligence in obtaining an accredited laboratory and certified technicians. Any delay or cost incurred by the Contractor in obtaining an AASHTO accredited laboratory or certified technician must be borne by the Contractor. If the Contractor chooses to ship the samples to another island or out-of-state location for testing, submit how the chain of custody of the samples will be maintained and how the samples will be protected from damage.

(q) Proposed concrete mix design, including expected strengths at 24 hours, 3, 7, 14, and 28 days. If the opening of pavement is to be scheduled for a period other than the period stated in this paragraph, submit a test for that period to ensure the concrete will meet Contract Documents requirements. The 24-hour break may be waived upon application for a waiver from the Engineer, however, no opening will be allowed at 24-hours if there are no tests performed. Submit test results of the trial mix conducted by a State-accepted material testing laboratory performed by certified technicians using methods specified in Subsection 601.03(B) – Design and Designation of Concrete. Submit the ready-mix supplier's certification with the mix design that the concrete mix to be used for the slip-form placement had acceptable results for the Box Test as shown in Subsection 601.03 - Construction.

(r) Submit with the mix design, how the CO_2 footprint reduction is intended to take place, e.g., the use of SCMs or admixtures, or carbon dioxide mineralization, to replace portland cement.

(s) Other pertinent information or information requested by the Engineer

The Engineer will review the paving plan for compliance with the Contract Documents. Within 30 days after the paving plan receipt, the Engineer will notify the Contractor if the paving plan is acceptable or if additional information is required, or if there is a need for clarification or a combination thereof. If applicable, make changes necessary to meet the requirements of the Contract Documents and address all comments made by the Engineer. The Engineer may reject all or parts of or the entire paving plan if found unacceptable.

Resubmit the entire paving plan with changes and required explanations for re-evaluation of the paving plan within 30 days. The Engineer will have the same amount of time for the review of each resubmitted paving plan as it did for the original submittal. Submit the revised paving plan to the Engineer until it is acceptable. Any delay due to the paving plan not being acceptable is solely a Contractor's delay and no additional compensation or contract time will be granted. However, if the Engineer's review and response to the paving plan exceeds the 30 days allowed for the review of each version of the paving plan, additional time and compensation may be claimed. Additional time and compensation will be considered by the Engineer only if it affects the current, contemporaneous, and accepted TLSD's critical path after the Contractor's resubmittal times are deducted and each of the Engineer's 30-day review times is credited for each resubmittal. Procedural acceptance given by the Engineer is subject to trial in the field.

A meeting must be held a minimum of 10 working days before the anticipated date of the first pour of the Portland cement concrete pavement (PCCP). This pre-pour meeting must be attended by the Contractor. Also, subcontractors, vendors, that will be involved with PCCP work, and other personnel that may be needed to answer questions about the PCCP work, i.e., means and methods are required to attend. The Engineer will attend and participate in the pre-pour meeting as well as any other personnel the Engineer invites. This pre-pour meeting must not occur before the paving plan is accepted by the Engineer and not sooner than five days after the JITT.

No placement of the production PCCP or test strip must occur before the pre-pour meeting is held. A JITT will not be an acceptable substitution for the pre-pour meeting unless the Engineer grants a waiver.

It is recommended that a post-pour meeting be held after the first production PCCP or test strip pour, to discuss what went right and what went wrong. This meeting is to improve the quality of the poured PCCP through the discussion of lessons learned. The Engineer may direct that a post-pour meeting be held.

The meeting is intended to clarify specifications or the paving plan or discuss

potential problem areas, areas of concern, etc. The meeting is not to be used to modify or change the Contract Document's requirements. While this can be discussed at the meetings, changing the Contract Document's requirements will require a contract change order or field order.

All testing must be performed by an Engineer accepted accredited material testing laboratory and certified technician. All samples must be collected and performed by personnel certified in that test method. For samples that will be used to determine compliance and acceptance of the material by the Engineer; the Engineer will transport the Department's samples to the laboratory from the project site for testing. Provide help, e.g., labor, equipment, material, to Department personnel when requested. Provide storage, transport facility, or both for the samples for use in the Department vehicle and project site. To determine compliance with the Contract Documents and acceptance by the Department samples of material must be taken with HDOT personnel present and having full custody of the sample.

(B) Equipment.

(1) Batching Plant and Mixers. Batching plant and mixers must conform to Section 601 - Structural Concrete.

(2) Hauling Equipment. Hauling equipment must conform to Section 601 - Structural Concrete.

(3) Finishing Equipment.

(a) Finishing Machine. The finishing machine must be self-propelled and equipped with at least two oscillating-type, transverse screeds that must finish the surface to meet requirements specified in Subsection 411.03(N) - Surface Test and Subsection 411.03(T) - Pavement Thickness. Finishing equipment must not displace reinforcement, side forms, or joints.

(b) Vibrators. Vibrators for full-width concrete consolidation may be either internal-type, with an immersed tube or multiple spuds, or surface pan type. Vibrators must be attached to the spreader or finishing machine and must be mounted on a separate carriage. Vibrators must not come in contact with reinforcement, load transfer devices, subgrade, and side forms.

Furnish vibrators that operate at frequencies not less than the following: 3,500 impulses per minute for surface vibrators; and 5,000 impulses per minute for internal and hand vibrators. Furnish tachometer for measuring and indicating

vibration frequencies. Vibrators must be tested before each of the pours to ensure that it is compliant.

Vibrator trails in the concrete pavement will be non-compliant work and removed. Continuation of the placement of concrete pavement must not proceed until the cause for the vibrator trails is found and eliminated and the remedial action accepted by the Engineer.

(c) Mechanical Floats. Mechanical floats must be self-propelled and designed to finish pavement surface uniformly smooth and true to grade. Run mechanical floats either on side forms or on adjacent lanes of concrete or prepared surface. No supports must be within the area where concrete is to be poured.

Floats must be constructed of hardwood, steel, or steel-shod wood and must be equipped with devices to permit adjusting the underside to a truly flat surface.

(d) Slip-Form Pavers. Slip-form pavers must be self-propelled and equipped with traveling side forms of sufficient dimensions, shape, and strength to spread, consolidate, and screed freshly placed concrete in one complete pass, with minimum hand finishing. Pavers must produce dense and homogeneous pavement, true to the cross-section and profile indicated in the Contract Documents.

Slip-form pavers must be equipped with high-frequency internal vibrators that vibrate concrete for full paving width and depth. A vibrator monitoring system is recommended to prevent vibrator trails.

Vibrators may be mounted with their axes either parallel or normal to pavement alignment. Where vibrators are mounted with their axes parallel to pavement alignment, space vibrators at intervals not to exceed 2.5 feet, measured center to center. Where vibrators are mounted with their axes normal to pavement alignment, space vibrators such that lateral clearance between individual vibrating units does not exceed 0.5 feet. Vibrators must produce a uniform level of vibration energy ranging from 5,000 to 8,000 VPM.

While pavement is being spread, compacted, and shaped, operate vibrating units such that the longitudinal axis, at the center of each unit, is not more than 0.5 feet above the existing paving surface.

Paving operations may be conducted using either one machine or mechanical spreader followed by a separate finishing unit.

(4) Concrete Saw. If sawed joints are specified or elected by the Contractor, furnish power-driven concrete saws sufficient in number, power, and type of blade to cut joints. Provide at least one backup saw and replacement blades during concrete sawing operations. Equip saws with blade guards and guides or devices to control alignment and depth. Remove all cuttings, slurry, and other by-products of the sawing operations from the work site and must not be allowed to remain on the pavement surface as well as in the sawed joints.

(5) Forms. Use 10-foot-long straight side forms made of metal having a thickness not less than 7/32 inch, with a depth equal to prescribed pavement edge thickness, and base width not less than 80 percent of prescribed pavement thickness. Horizontal form joints will not be allowed unless built-up forms, as specified in this subsection, are accepted by the Engineer. Forms must be sufficiently rigid to prevent edge alignment distortion under subgrading and equipment loads or concrete pressure, or a combination thereof. Furnish form sections that are straight, free from bends, warps, indentations, and other defects. Sections that deviate from the true plane along the top of form more than 1/8 inch in 10 feet or along the face of form more than 1/4 inch in 10 feet will be rejected.

Join form lengths in a manner that ensures tight, leak-proof, neat joints at form connections and prevents springing from occurring under subgrading and paving equipment loads or concrete pressure, or a combination thereof. Built-up forms may be used by rigidly attaching sections of suitable width and thickness to either top or bottom of the form. If built-up is attached to the top of the form, use metal built-up.

For curves of a 100-foot radius or less, use flexible forms or curved forms having a proper radius. Special forms of wood or metal may be used for curved form lines having a radius of 200 feet or less. Five-foot-long, straight metal form sections may be used for curved form lines having a radius greater than 100 feet. Straight metal forms in sections 10 feet or less in length may be used for form lines having a radius greater than 200 feet.

Special forms of wood or metal may be used for curved form lines having a radius of 200 feet or less. Where use of standard

pavement forms is not feasible, submit working drawings at least 10 working days before production. Five-foot-long, straight metal form sections may be used for curved form lines having a radius greater than 100 feet.

Use of wood forms as a track for operating paving and finishing equipment will not be allowed.

(C) Preparing the Proper Grade. Trim beyond edges of proposed concrete pavement to accommodate forms and slip-form paving equipment. Fill and compact areas that are below established grade with subgrade or base course material, in lifts up to 1/2 inch, for widths of 18 inches on both sides of form base. Tamp and trim areas above-established grade, as necessary.

(D) Setting Forms. Before placing forms, compact foundation to ensure continuous contact with forms. Set forms and check for correct line and grade before placing concrete. Tamp inside and outside edges of form base. Use three pins for each 10-foot section to stake forms in place. Place pins on each side of every joint. Lock form sections to prevent play or movement in any direction. Forms must withstand impact and vibration due to consolidation operations and must remain true to within 1/4 inch. Before placing concrete, clean and coat forms with form release agent or oil, accepted by the Engineer. At least one working day before placing concrete, notify the Engineer that the forms are ready for inspection. Check for compliant thickness by doing a test run using all the equipment that will be used to place and finish the concrete for the pavement.

(E) Conditioning of Subgrade or Base Course. Unless a waterproof cover material is indicated in the Contract Documents, keep subgrade and base course uniformly moist, near SSD, before placing concrete. The subgrade and base course must not exceed the temperature of the concrete being placed by more than 10 degrees F. Lower the temperature of the subgrade and base course with foggers or other Engineer accepted methods before placing the concrete.

(F) Handling, Measuring, and Batching Materials. Handle, measure, and batch materials in accordance with Section 601 - Structural Concrete.

(G) Mixing Concrete. Mix concrete in accordance with Section 601 - Structural Concrete.

(H) Mixing Limitations and Water Supply. Provide adequate natural or artificial lighting when mixing, placing, finishing, and sawing concrete.

Place mixed concrete only when the concrete temperature is between

50 and 90 degrees F. Use Plastic Shrinkage Evaporation Chart ACI 305 and Section 503 – Concrete Structures as the method to determine if additional precautions should be taken to prevent shrinkage cracks, e.g., foggers.

Before placing concrete pavement, provide an adequate supply of water for the entire work period. Inadequate water supply will be sufficient cause for delaying or stopping mixing operations. If there is a water supply deficiency, give first water-use priority to curing concrete already placed before using water for mixing concrete.

(l) Placing, Consolidating, and Shaping Concrete.

(1) General. Make advance arrangements for preventing a delay in concrete delivery and placement. An interval of more than 30 minutes between the placement of two consecutive batches or loads shall constitute a cause for stopping paving operations and requiring a construction joint to be placed. Such a construction joint must be installed at no increase in the contract price or contract time, at the location and of the type ordered by the Engineer.

Conditioning of Subgrade or Base Course. Unless waterproof cover material is indicated in the Contract Documents, keep subgrade and base course uniformly moist before placing concrete i.e., leave aggregate surfaces used as the subgrade or base course in a cool, nearly saturated surface dry (SSD) condition. The subgrade or base course must be kept within 15 degrees of the anticipated concrete temperature to minimize thermal shock and cracking. For placement surfaces that are formed, e.g., bridge deck, keep the form temperature within 15 degrees of the anticipated concrete temperature by using fogging or other Engineer accepted methods.

Before placing concrete, demonstrate proper adjustment of screeds and floats on slip-form pavers by measurements from grade stakes driven to known elevations. Placement of concrete must not start until this is done. Demonstrate satisfactory operation and adjustments of propulsion and control equipment, including pre-erected grade and alignment lines, by running slip-form pavers and finishing machines over the entire length of prepared subgrade or base course with propulsion and control equipment fully operational and loaded.

Unless otherwise indicated in the Contract Documents, construct pavement in full-lane widths separated by longitudinal weakened plane joints, or monolithically in multiples of full-lane widths, with longitudinal weakened plane joints at each traffic lane

line.

Deposit concrete with minimum handling. Spread concrete uniformly over the entire area between forms, without segregation, using a mechanical spreader. Where hand methods are necessary due to pavement design, equipment breakdown, or other factors, use shovels, not rakes, for hand spreading. Place concrete continuously between transverse joints without using intermediate bulkheads. Prohibit workers from walking in concrete with boots or shoes coated with earth or foreign substances.

Improperly proportioned concrete will be rejected. Remove and dispose of concrete rejected by the Engineer in accordance with Subsection 201.03(F) - Removal and Disposal of Material, at no increase in the contract price or contract time.

Spread, consolidate, and shape concrete so that the completed pavement will comply with the thickness and cross-sectional requirements indicated in the Contract Documents. Sides of pavement may be constructed with batter not exceeding one horizontal to six vertical, provided that pavement top width is maintained as indicated in the Contract Documents.

Where widening PCC pavement contiguous with existing parallel concrete pavement not constructed as part of the contract, spread, consolidate, and shape concrete so that completed pavement will comply with the thickness and cross-sectional requirements indicated in the Contract Documents and to the following:

(a) Elevation of completed pavement surface must be such that water will not pond on either side of the longitudinal joint with the existing pavement.

(b) New pavement surface at longitudinal joint must conform to the elevation of the existing concrete pavement. If necessary, provide a smooth transition between new and existing pavement by hand-finishing new pavement within one foot of existing pavement, adding or removing concrete, as necessary.

(c) Transverse straightedge, longitudinal straightedge, and Profile Index requirements specified in Subsection 411.03(M) - Final Strike-Off, Consolidation, and Finishing and Subsection 411.03(N) - Surface Test will not apply to pavement surface within 1-foot of existing concrete pavement or within an Engineer directed increase of the transition area. However, in

the sole opinion of the Engineer, the surface finish of the installed concrete pavement exhibits poor workmanship, e.g., the finished surface is rougher than the existing surface, and the roughness of the surface cannot be attributed to the existing concrete pavement profile measurements may be taken in those areas.

(d) Profiles of completed pavement surface specified in Subsection 411.03(N) - Surface Test will not be required within one foot of a longitudinal construction joint with existing concrete pavement unless, in the opinion of the Engineer, the surface finish of the installed concrete pavement exhibits poor workmanship, e.g., the finished surface is rougher than the existing surface, the roughness of the surface cannot be attributed to the existing concrete pavement.

(e) Thickness measurements specified in Subsection 411.03(T) - Pavement Thickness will not be made in pavement within one foot of existing concrete pavement.

(f) Transverse weakened plane joints must be constructed in pavement widening to match the spacing and skew of weakened plane joints in the existing pavement.

Where concrete is to be placed adjacent to previously constructed pavement, keep mechanical equipment off previously constructed pavement until the newly placed concrete pavement has attained a flexural strength of not less than 550 pounds per square inch when tested in accordance with AASHTO T 97.

Where concrete is being placed adjacent to existing pavement, provide that the part of equipment supported on existing pavement, is equipped with protective pads on crawler tracks or has rubber-tired wheels. Offset the bearing surface to run at a sufficient distance from the pavement edge to avoid breaking or cracking that edge.

(2) Stationary Side Form Construction. Provide enough forms so that no delay occurs due to the lack of forms. Spread, consolidate, and shape concrete by one or more machines. Keep the slump of the concrete within 1 inch± of each batch placed. Use machines that uniformly distribute and consolidate concrete without segregation, so that completed pavement conforms to the cross-section indicated in the Contract Document, with minimum handwork.

Furnish paving machines in sufficient number and capacity to finish work at a rate equal to that of concrete delivery.

Consolidate concrete for full paving width using surface or internal vibrators, or by another method of consolidation that produces equivalent results without segregation or voids.

Operate vibrators at the manufacturer's recommended frequencies based on compatibility with pertinent factors, including the following: mix design, concrete slump, paver speed, and vibrator spacing. Vibration amplitude must be sufficient to be perceptible on the concrete surface more than one foot from the vibrating element.

Do not rest vibrators on new pavement or side forms. Connect power to vibrators so that vibration ceases when the forward or backward motion of the machine is stopped.

(3) Slip Form Construction. Slip form paving equipment must spread, consolidate, and screed freshly placed concrete to produce dense, homogeneous pavement, true to cross-section and profile, with minimum handwork.

Use reference lines outside the finished concrete limits to regulate paver alignment and elevation during concrete placing and finishing operations. Abrupt changes in longitudinal alignment will not be allowed. Limit horizontal deviation to no more than 0.1 foot from alignment established by the Contract Documents.

Coordinate operations of mixing, delivering, and spreading concrete to allow slip-form paving equipment to operate in continuous forward movement, with minimal stopping and starting. When paver forward movement is stopped, immediately cease vibrating and tamping operations. Do not apply tractive force to the paving machine except that which is controlled by the machine.

Consolidate concrete for full paving width using high-frequency vibrators. Operate vibrators at the manufacturer's recommended frequencies based on compatibility with pertinent factors, including the following: mix design, concrete slump, paver speed, and vibrator spacing. Vibration amplitude must be sufficient to be perceptible on the concrete surface along the entire length of vibrating units and for a distance of at least one foot therefrom.

(J) Test Specimens. Furnish concrete necessary for casting test beams and cylinders and for testing air and slump. Unless otherwise indicated in the Contract Documents, furnish, maintain, and clean beams or cylinder molds, or both. Beams or cylinder molds, or both must conform to AASHTO R 100, Standard Practice for Making and Curing

Concrete Test Specimens in the Field.

Cure beams, as specified for pavement, in accordance with AASHTO R 100 For early opening to traffic, cure flexural test specimens at the same time and in the same manner as pavement.

Additional flexural strength test specimens will be required due to concrete placement conditions or to determine concrete strength where the early opening of pavement to traffic is dependent on concrete strength test results.

(K) Striking-Off Concrete and Placing Reinforcing Steel. After placement, strike off concrete to the cross-section indicated in the Contract Documents.

Where pavement is placed in two layers, strike off and consolidate the bottom layer to a depth necessary to place fabric or reinforcing steel mat directly on concrete. Support reinforcing steel as needed to maintain its correct position.

Place the top layer within 30 minutes of the first layer, or remove and replace the lower layer with freshly mixed concrete.

Where pavement is placed in one layer, position reinforcing steel before placing concrete.

For reinforcing steel, Subsection 602.03(B) - Storage, Surface Condition, and Protection of Reinforcement must apply.

(L) Joints. Construct joint faces normal to the pavement surface, as indicated in the Contract Documents. Use chalk line, string line, sawing template, or other methods to provide true joint alignment. Before contract acceptance, maintain joints free of soil, gravel, concrete or asphalt mix, and other foreign material except for filler material.

Where sawing method is used to cut pavement grooves, use a saw complying with Subsection 411.03(B)(4) - Concrete Saw. Saw joints before uncontrolled shrinkage cracking occurs, but only after concrete has hardened sufficiently to prevent excessive tearing or raveling, or both during sawing operations. Determining concrete readiness for sawing transverse contraction and longitudinal joints in accordance with requirements specified herein must be the Contractor's responsibility. Cut grooves to the minimum width possible for the type of saw used, but limit groove width to 0.02 feet.

Once sawing has commenced for any day's concrete placement, continue sawing for 12 hours after placement. Should sawing fail to be

completed within 12 hours of concrete placement, limit subsequent concrete placements to quantities that can be sawed in 12 hours. Restore curing membrane disturbed during sawing operations by spraying disturbed areas with additional curing compound.

(1) Longitudinal Joints. Place deformed tie bars, two-piece connectors accepted by the Engineer, and smooth dowels, as indicated in the Contract Documents, perpendicular to the longitudinal joint. Deformed tie bars and two-piece connectors must be 30 inches long, Grade 60 No. 5 bars, placed 30 inches apart at mid-depth of the slab. Where deformed tie bars are to be bent and later straightened, use Grade 40 bars. Place bars using mechanical equipment, or secure bars with chairs or other supports in accordance with Section 602 - Reinforcing Steel. Use other required sizes, grades, lengths, and spacings, based on slab width, thickness, and type of underlying base.

Unless otherwise indicated in the Contract Documents, tie bars may be inserted into plastic concrete. If this method results in tie bar misalignment, poor consolidation around tie bars, concrete surface or edge slumping, or a combination thereof, discontinue using this method and complete work using other methods accepted by the Engineer.

Construct longitudinal joints by sawing method at traffic lane lines in multilane, monolithic concrete pavement. Cut longitudinal joint to minimum depth d = t/3, where:

d = minimum depth of cut rounded up to nearest 0.01 feet.
t = greatest pavement thickness (feet) in each lane.

Where adjacent lanes are constructed separately, use deformed tie bars or smooth dowels, as indicated in the Contract Documents. Two-piece connectors accepted by the Engineer may be used.

Clean all joint faces of any curing compound, primer or any material that may be deleterious to the bonding of the new concrete to the existing or previously poured concrete.

(2) Transverse Expansion Joints. Extend transverse expansion joint to the full cross-section of PCC pavement and install a continuous piece of preformed joint material. When installing a joint filler, depress the filler 1/2 inch below the pavement surface.

Hold expansion joint filer in a vertical position and limit

deviation to not more than 1/4 inch from a straight line along the centerline of the joint. Hold filler on line with metal channel. Remove channel after initial concrete set.

(3) Transverse Contraction Joints. Construct transverse contraction joints by forming or sawing grooves on the pavement surface. Where indicated in the Contract Documents, include dowel bars and assemblies.

Transverse contraction joints may be formed by depressing a tool or device into plastic concrete before the initial concrete set.

If uncontrolled shrinkage cracking occurs during or before joint sawing, modify sawing sequence accordingly or use other methods accepted by the Engineer. If necessary to eliminate uncontrolled shrinkage cracking, add more sawing units or use early entry concrete cutting machines with special blades that cut through relatively fresh concrete without needing water. Where transverse crack occurs before sawing and any point on crack is within 5 feet of planned transverse contraction joint, omit sawing the planned joint.

Unless otherwise indicated in the Contract Documents, construct groove between depths of 1/3 to 1/4 of pavement thickness.

(4) Construction Joints. When concrete placement is interrupted for more than 30 minutes, construct longitudinal and transverse construction joints in accordance with the Contract Documents. Placement of a construction joint within 10 feet of another transverse joint will not be allowed. At the time of interruption, if sufficient concrete has not been mixed to form a slab greater than 10 feet long, remove and dispose of concrete back to the preceding joint, at no increase in the contract price or contract time. When concrete placement is stopped, provide a bulkhead having a sufficient cross-sectional area to prevent deflection, notched to receive dowels, and shaped to pavement cross-section. The bulkhead must be placed perpendicular to the baseline and must also be one straight across the entire width of the pavement.

(5) Dowels for Longitudinal, Transverse, Expansion, and Contraction Joints. As indicated in the Contract Documents, provide smooth, straight dowels, conforming to Subsection 709.01(E) - Dowels; and deformed dowels conforming to Subsection 709.01(F) - Tie Bars.

At transverse joints, space dowels in the pavement at one-foot

centers, parallel to the pavement surface and traffic direction.

Use joint assemblies or wire baskets that remain in the pavement to hold dowels in place during concrete placement and finishing. For referencing, properly mark the center of the dowel assembly on both sides of the pavement slab.

For expansion joints, unless otherwise indicated in the Contract Documents, use dowels with one end of each coated dowel encased in a cap conforming to Subsection 709.01(E)(2) - Joint Dowels.

Place dowels in the pavement with alignment tolerance of ±1/4 inch per dowel and depth d = t/2, where:

d = minimum depth, rounded up to the nearest 0.01 feet.
t = pavement thickness (feet) in each lane.

Maintain dowel position and arrangement when placing and consolidating concrete around dowels.

Unless otherwise indicated in the Contract Documents, coat the entire length of each dowel with de-bonding material accepted by the Engineer. At the Contractor's option, dowels may be lightly coated with grease accepted by the Engineer. Use of cutback asphalts, emulsions, or oils will not be allowed for coatings.

(M) Final Strike-Off, Consolidation, and Finishing.

(1) Sequence. Sequenced operations are as follows: strike-off, consolidate, float, remove laitance, straightedge, and perform final surface finish. Provide work bridges and other equipment necessary to reach pavement surface to inspect, straightedge, finish, and perform corrective work as necessary.

Finish concrete surface without adding water to the surface.

(2) Finishing at Joints. Strike-off, consolidate, and finish, in a manner that does not damage or misalign, or both, joint assemblies, load transfer devices, and other embedded items. Vibrate concrete mechanically next to joints without creating voids or segregation, or both.

If the finishing operation causes segregation, damage, joint misalignment, or a combination thereof, stop finishing equipment when the screed is approximately 8 inches from the joint. Remove segregated concrete surrounding the joint. Lift front screed and set it

directly over joint before continuing forward motion. Lift and carry a second screed over the joint when it is close enough to force excess mortar over a joint. If segregation is prevented, subsequent finishing over the joint without lifting screeds will be allowed.

(3) Machine Finishing.

(a) Nonvibratory Method. Use finishing equipment to strike off, screed, and texture concrete immediately after it is distributed or spread. Avoid excessive finishing. Keep top of forms free of concrete and debris.

Maintain uniform ridge of concrete along entire paving width and ahead of screed during the first pass of finishing machine.

(b) Vibratory Method. Vibrators for full-width vibration of concrete paving slabs must comply with Subsection 411.03(B)(3)(b) - Vibrators. When uniform and satisfactory concrete density is not obtained by the vibratory method, furnish other equipment and methods that produce pavement conforming to the contract. Where not in conflict with provisions in Subsection 411.03(M)(3)(a) – Nonvibratory Method, provisions for vibratory method, must govern.

(4) Hand Finishing. Use hand-finishing methods only under the following conditions and locations:

(a) When mechanical equipment breaks down, stop concrete placement and hand-finish concrete already in place.

(b) In areas of narrow widths or irregular shapes, hand-finish those areas that cannot be finished by mechanical equipment.

(c) Hand floating in other portions of the Contract Documents must be performed.

Use portable screed to strike-off and screed concrete. Provide a second portable screed to strike off the bottom concrete layer when placing reinforcing steel during two-layer concrete placement.

Use metal screed or metal-reinforced screed, which is at least 2 feet longer than the widest part of the slab to be placed.

Consolidate concrete with a hand-operated vibrator.

Move screed along forms in forwarding motion that combines longitudinal and transverse shearing motion without raising either end from side forms. Repeat this strike-off process until pavement is true to grade and cross-section, and surface texture is uniform and free of porous areas.

(5) Floating. After striking off and consolidating concrete, use float to finish the surface to specified grade and smoothness. Use one of the following methods:

(a) Hand Method. Use hand-operated, longitudinal float at least 12 feet long and 6 inches wide and sufficiently rigid to retain its shape. Operate longitudinal float from footbridges. Work the float in a sawing motion while holding it in a position parallel to the road's centerline and passing it gradually from one side of the pavement to the other.

Move ahead along the pavement centerline, advancing not more than one-half of float length. Waste excess water and laitance over side forms on each pass.

(b) Mechanical Method. Adjust tracks and float to the required crown. Coordinate float with adjustments of transverse finishing machine so that a small quantity of mortar is maintained ahead of the float. Operate float over the pavement a few times and at such intervals as is necessary to produce a surface of uniform texture. Excessive operation over a given area will not be allowed. Waste excess water and laitance over side forms on each pass.

(c) Alternate Mechanical Method. Use equipment with cutting and smoothing float or floats, suspended from and guided by a rigid frame mounted on four or more visible wheels. Maintain constant contact of all four wheels with forms.

After mechanical floating, use the hand method to fill open-textured areas in the pavement or if the method does not provide an acceptable finish.

(d) Slip-Form Finishing. Construct pavement with preliminary float finish using devices incorporated in slip-form paver. Suitable machine floats may be used to supplement the finish achieved by the slip-form paver.

Before concrete has hardened, correct pavement edge

slump, exclusive of edge rounding, over 0.02 feet.

(6) Evaporation Retarders and Finishing Aids --See Subsection 503.03(F)(8) - Evaporation Retarders and Finishing Aids.

(7) Addition of Water at the Project Site – See Subsection 503.03(F)(1) - General.

(8) Straightedge Testing and Surface Correction. After completing floating and removing excess water and laitance, correct surface irregularities while concrete is plastic. Fill, strike-off, consolidate, and refinish depressions. Cut down and refinish high areas. Smooth surface across joints to tolerances indicated in the Contract Documents.

Test plastic concrete surface for trueness using a 12-foot straightedge swung from a handle that is 3 feet longer than one-half of slab width. Hold the straightedge in contact with the surface in successive positions parallel to the road's centerline. Test entire pavement width, moving from one side of the slab to the other, as necessary. Advance testing operation along the road, in successive stages of not more than one-half straightedge length.

(9) Final Finish. After the surface sheen has disappeared, texture the pavement surface without tearing it. Texture final surface using artificial turf drag followed immediately by metal comb transverse grooving device (tining). The use of the metal comb is not needed if the surface requires mechanical texturing, e.g., grooving, Next Generation Concrete Surface (NGCS).

Use artificial turf made of molded polyethylene with synthetic turn blades measuring approximately 0.75 inches long and containing approximately 5760 individual blades per square foot. Submit a sample of artificial turf at least five working days before production.

Attach artificial turf to self-propelled equipment having external alignment control. The device must be a separate piece of equipment to be used exclusively for texturing operation and must not be attached to other paving-train equipment. Artificial turf must be full pavement width and of sufficient size that during finishing operation, approximately 2 feet of turf, parallel to pavement centerline, is in contact with the pavement surface across the width of the pavement. Maintain downward pressure on pavement surface with turf, to achieve uniform texturing without measurable variations in pavement profile.

Grooving (tining) with a metal comb must include a single line of evenly spaced, tempered spring steel tines of size and stiffness sufficient to produce grooves of specified dimensions in plastic concrete without edge slumping and severe surface tearing. Attach a metal comb to a mechanical device capable of grooving the entire pavement width in a single pass at a uniform speed. Operate grooving device to produce a uniform pattern of grooves parallel to pavement centerline. Evenly spaced grooves must have in the hardened pavement surface a uniform tine spacing of 0.75 inches between centers. Grooves must be 1/8 inch to 3/16 inch deep, and 1/10 inch to 1/8 inch wide. Provide hand combs with steel tines to use in event of mechanical comb breakdown.

Ramps tapers, and miscellaneous i.e. small and irregular areas may be textured manually. The Engineer will determine at what point the pavement will not be allowed to be textured manually.

(10) Edging at Forms and Joints. After the final finish, tool pavement edges to a radius of 1/4 inch, along both sides of each slab; and on both sides of transverse expansion joints, formed joints, and construction joints. Produce a smooth, dense mortar finish.

Eliminate tool marks on the slab, next to joints. Avoid disturbing rounding of slab corners. Remove concrete from joint filler top.

Before concrete sets, test joints with a straightedge and correct unevenness between joints and adjacent slabs.

(N) Surface Test. The request date for acceptance profile testing must not be less than 30 days following concrete placement. The request for an acceptance profile test must be made only when the Contractor has determined, using HDOT TM 6, or ProVal that the pavement profile complies with the requirements of the Contract Documents. If the Engineer does not test the surface until after 30 days after the last concrete placement within the test area, the results must be considered valid. The finished pavement must comply with the following requirements when tested by the Engineer:

(1) Conduct surface test using a 12-foot straightedge at locations determined by the Engineer. When the straightedge is laid on the finished pavement in a direction parallel or normal to the centerline, the surface must not vary more than 1/4 inch from the lower edge.

(2) The Engineer will determine the profile of the pavement surface using a profilograph in accordance with HDOT TM 6 or ProVal and

these specifications. The Engineer will take two profiles going in the same direction, 3 feet from and parallel to each pavement edge, and another set of two profiles going in the same direction, 3 feet from and parallel to the approximate location of each longitudinal joint for a total of four profiles. Use the testing machine's GPS to ensure that the two profile test paths taken on each side of the lane are as identical as possible. The Engineer may make changes to the location of the test path so that the test path is within the anticipated wheel path. Shoulders must be regarded as lanes. Shoulders over 12 feet wide must be regarded as multiple lanes. The Engineer will determine where the profile test paths will be located for the shoulders.

Make an acceptance profile test request to the Engineer at least seven days before the desired testing date. When a request for acceptance profile testing is made, submit the total area to be tested, and indicate the limit of the testing on a copy of the Contract plans. Clean the pavement and clear obstructions from the area to be tested. The area 100 feet or more before and after the area to be tested must be clean and clear of obstructions. The Contractor may cancel The Contractor must provide traffic control for profile testing. If in the sole opinion of the Engineer the pavement is not clean enough or obstacles are in the way or traffic control is not sufficiently safe the Engineer may cancel the acceptance profile test and count it as one acceptance profile test.

Provide a California Type Profilograph, labor, material, and other ancillary equipment to be used under the Engineer's supervision or for the Engineer's designated representative, e.g., third-party QA entity, consultant to do pavement profile testing, e.g., initial and any needed follow-up tests, when requested by the Engineer. The Contractor's means and methods of taking the pavement profile must be using a California-type profilograph in accordance with HDOT TM 6 Standard Practice for Operation of the California Type Profilograph and Evaluation of Profiles and these Contract Documents. The Contractor's equipment, e.g., profilograph must be certified as well as the personnel operating it. Certification must be by an entity accepted by the Engineer.

Any delay that occurs due to equipment not being available or certified or a lack of certified personnel will be regarded as a Contractor's delay.

The Engineer will perform an initial acceptance profile test set, at no cost to the Contractor.

If the pavement profile is found non-compliant the Contractor must do remedial repairs. Based on the Engineer's initial acceptance profile test set, the Contractor must perform remedial work before requesting a follow-up acceptance profile test. Re-profile test the area

to ensure compliance with requirements before requesting another acceptance profile test. Perform additional remedial work and perform follow-up acceptance profile testing until an acceptable surface is obtained.

Additional testing, beyond the initial acceptance test, will be performed at a cost to the Contractor of $1,500 per test set per lane or $3,500 per day whichever is greater to pay for HDOT's personnel expenses for testing beyond the initial acceptance test plus any additional charges the Engineer deems are applicable. Payment may be made to the Material Testing and Research Branch or any State of Hawaii entity as directed by the Engineer or it may be deducted from any payment due to the Contractor.

During initial paving operations or after a long shutdown, when the concrete has cured sufficiently to allow profile testing, furnish, operate, and profile test the pavement to ensure that the means and methods being used will produce a pavement profile compliant with the requirements of the Contract Documents.

The Contractor and the Engineer will use the profile testing results to aid in evaluating paving methods and equipment. When the average profile index exceeds 15 inches per mile, suspend paving operations. Resumption of paving operations will not be allowed until corrective action is taken to the means and methods and accepted by the Engineer. Subsequent paving operations will be tested in accordance with the current profile testing procedures.

Use paving equipment and methods that produce riding surfaces having a profile index of 10 or less, except as provided herein.

Profile testing with a straight edge must be performed for the following pavement areas:

(a) Within superelevation transition on horizontal curves having a centerline curve radius less than 1,000 feet.

(b) Within 15 feet of transverse joint that separates pavement from existing pavement not constructed under the Contract or from structural deck or approach slab.

These areas must be checked with a 12-foot straight edge.

For all areas reduce individual high points over 0.3 inches, as determined by profilogram measurements in accordance with HDOT TM 6, by diamond grinding until such high points shown by profilograph reruns do not exceed 0.3 inches. Diamond grinding refers to a process where closely spaced gang-mounted diamond saw blades are used to shave off a thin, top layer of a hardened concrete surface

After completing the diamond grinding of high points, perform additional diamond grinding as necessary to a pavement profile in compliance with the requirements specified.

1. Perform additional diamond grinding as necessary so that lateral limits of grinding are at a constant offset from and parallel to the nearest lane line or pavement edge.
2. Perform additional diamond grinding, as necessary, to extend the area ground within any one surface area, in each longitudinal direction so that the diamond grinding begins and ends at lines normal to the pavement's centerline.
3. Ground areas must be neat, rectangular areas having a uniform surface appearance.

Do not diamond grind pavement to a smooth or polished finish unless otherwise indicated in the Contract Documents.

Diamond grinding must provide a line-type texture that contains parallel, longitudinal corrugations with ridge peaks approximately 1/16 inch higher than groove bottoms; and with 55 to 60 evenly spaced grooves per foot.

After diamond grinding is complete, mechanical texture, i.e., diamond grind grooves into the previously diamond ground surface. The grooves must align and match with the tine grooves or the diamond blade mechanically installed grooves of the unground surfaces. The grooves must produce a uniform pattern of grooves parallel to the pavement's centerline. Evenly spaced grooves must have in the hardened concrete pavement surface a spacing of 0.75 inches between centers. Grooves must be 1/8 inch to 3/16 inch deep, and 1/10 inch to 1/8 inch wide. If the mechanical texturing is Next Generation Concrete Surface (NGCS) for the area surrounding the diamond ground surface follow the Next Generation Concrete Surface's pattern.

Pick up all grinding-operation residue using a vacuum attached to the grinding machine. Prevent residue from flowing across the pavement or from being left on the pavement surface or being tracked to the surrounding areas. Dispose of grinding residue at an Engineer and Department of Health accepted dump site.

The use of bush hammers, other impact devices, cold milling, and other methods that may, in the sole opinion of the Engineer, cause micro-cracking must not be used for pavement surface remediation.

Repair curing membrane damaged during surface remediation and testing operations if curing is still required.

The Contractor may dispute the results of the acceptance profile test and request a retest. In the request, the Contractor must state specifically why the test profile is in error and should be redone. If the retest results show a compliant profile there will be no charge for the retest and will be the sole remedy for this dispute. However, if the retest shows a non-compliant profile charges for additional profile tests will apply. The retest must take place at the same time of day and have nearly the same ambient weather conditions. The Contractor may also request a re-evaluation of the data, specifically indicating why the test profile evaluation by the Engineer is in error despite the data being collected by the Contractor's equipment. A meeting may be allowed by the Engineer to discuss the re-evaluation if the Engineer decides it would benefit the resolution of the dispute.

Complete corrective work before determining pavement thickness in accordance with Subsection 411.03(T) - Pavement Thickness.

(O) Curing. After finishing operations have been completed and as soon as marring of concrete will not occur, cure the entire newly placed concrete surface and edges in accordance with one of the methods described in this subsection. If forms are used, spray curing compound on the surface that was covered by the forms immediately after striping the form from the concrete. When curing requires the use of water, assign the highest priority for project water supply allocation to curing operations. Suspend concrete operations if there is insufficient cover material or water supply for curing and other project requirements. Do not leave concrete exposed for more than 30 minutes between stages of curing or during the curing period. Use atomized fog spray to place water into the air to increase the humidity as an interim cure or other methods accepted by the Engineer until the final curing medium is in place. Cure concrete for at least 72 hours immediately after finishing the operation.

(1) Cotton or Burlap Mats. Cover surfaces to be cured with cotton or burlap mats having dimensions that when placed, extend at least 2 feet beyond the edges of the concrete strip placed. Overlap mats at least 6 inches. Place and maintain mats in complete contact with the surface being cured, throughout the curing period. Keep the cotton or burlap mats fully moist and in position for the entire length of the required curing period.

(2) Waterproof Paper. Thoroughly wet pavement surface and edges before placing paper. Cover surfaces to be cured with waterproof paper sized to extend when sheets are placed, at least 2 feet beyond edges of concrete strip; or sized to match pavement width and supplemented with 2-foot paper edge strips. Overlap sheets at

least 18 inches. Place and maintain paper in complete contact with the surface being cured, throughout the curing period. When sheets are laid longitudinally, seal the paper so that it does not open up or separate during the curing period.

(3) White-Pigmented Curing Compound. Immediately after the finishing surface and before the concrete set has taken place, spray uniformly surfaces to be cured with a white-pigmented curing compound. There must be no holidays or streaking in the coat of the curing compound. Also, the white-pigmented curing compound must remain white and not allow the concrete's color to show through for the duration of the curing period. If it does show through reapply the white-pigmented curing compound/. When cotton or burlap mats are used to initially cure pavement, apply the white-pigmented curing compound upon removal of mats. Do not apply curing compound during and immediately after rainfall.

Use a fully atomized mechanical sprayer equipped with a tank agitator and wind guard to apply the two coats of curing compound, under pressure, at a rate of at least one gallon per 100 square feet per coat. Before spaying, the compound it must be in a thoroughly mixed uniform condition with pigment uniformly dispersed throughout the tank. Mechanically agitate the curing compound continuously during application. Hand-pump sprayers will be allowed only for spraying irregular widths and shapes and concrete surfaces exposed by form removal. Do not apply curing compound to the inside faces of joints to be sealed. However, if the curing period is not over, use other methods to continue the curing, e.g., wet burlap mats or lithium curing compound. Provide a means to verify the application rate of the curing compound being applied.

If curing film is damaged during the required curing period, immediately repair damaged portions with additional curing compound. Upon removal of side forms, immediately protect exposed slab edges with curing treatment equivalent to that provided for pavement surface.

(4) White Polyethylene Sheeting. Cover surfaces to be cured with polyethylene sheeting sized to extend when sheets are placed, at least 2 feet beyond the edges of the concrete strip. Overlap sheets at least 18 inches. Place and maintain sheeting in complete contact with the surface covered, throughout the curing period.

(5) If the construction joint requires that it bonds with the concrete poured against it a lithium curing compound will be acceptable as

a curing compound. Lithium curing compound must not be used on the horizontal surface in place of other aforementioned curing methods unless specifically called for by the Contract Document, or a waiver is granted by the Engineer. A lithium sealer will not be accepted as a curing compound. The lithium curing compound must meet or exceed the requirements of ASTM C-309, and ASTM C-1315 and be a 28-day water cure equivalent. All work must comply with the manufacturer's recommendations.

(P) Removing Forms. Keep forms in place for at least 12 hours. Protect pavement from damage during form removal. After removing forms, immediately cure exposed surfaces in accordance with Subsection 411.03(O) - Curing. Pavement areas containing major honeycombed areas will be rejected. Remove and replace rejected pavement areas that are full-lane-wide sections and at least 10 feet long; and in those areas where removal and replacement are necessary, remove remaining portions of the slab that are less than 10 feet long and adjacent to joints.

(Q) Sealing Joints. When required by the Contract Documents clean and seal joints after completion of the curing period and before the pavement is opened to traffic. Clean each joint thoroughly of foreign matter, including debris, dirt, dust, concrete, saw cuttings, and all curing material in the joint. Collect and dispose of all removed material.

Dry joint surfaces before sealing joint, if compressed air is used it must be oil-free air. The method used to dry the joint must not be deleterious to the joint and to the properties of the sealant. Apply sealing material as indicated in the Contract Documents. If a hot sealer is used, continuously stir the material during heating to prevent localized overheating. Pour sealing material without spilling on exposed concrete pavement surfaces other than the joint faces. Immediately remove and clean excess material from the pavement surface. Do not use sand or similar material as a cover for sealing material. The sealing material must not be above joint edges unless specifically called for in the Contract Documents. Joints that have sealing material that is above the joint edges must be completely removed and replaced.

(R) Protection of Pavement. Protect pavement and its appurtenances from public and construction traffic, and other things and events that may cause damage. Protection must include but is not limited to using flaggers to direct traffic; and erecting and maintaining warning signs, lights, pavement bridges, and crossovers.

Where indicated in the Contract Documents, construct pavement

crossings for convenience of public traffic in accordance with Subsection 104.09 - Maintenance of Traffic.

Furnish and install materials for edge and surface protection of unhardened concrete. Edge protection materials include but are not limited to standard metal forms and wood planks that have a nominal thickness of not less than 2 inches and a nominal width of not less than pavement-edge thickness. Surface protection materials include burlap or cotton mats, curing paper, and plastic sheeting. Stop paving operations when rain appears imminent and install a transverse construction joint perpendicular to the centerline.

Repair or replace damaged pavement, as accepted by the Engineer, before final acceptance.

(S) Opening to Traffic. Allow traffic on the pavement when test specimens comply with Subsection 411.03(J) - Test Specimens have attained flexural strength of 550 pounds per square inch when tested in accordance with AASHTO T 97. Traffic will not be allowed on pavement sooner than seven days after concrete placement, regardless of strength attainment.

Clean roadway, install required signs, mark pavement complying with the MUTCD and Contract Documents, and clear pavement of obstructions before opening the roadway to public traffic.

Construction traffic, equipment, and materials will not be allowed on the pavement during the curing period.

(T) Pavement Thickness. The Engineer will determine coring locations and observe the coring operation. The Engineer will check the thickness of the pavement by cores obtained by the Contractor in accordance with AASHTO T 24. The Engineer will measure cores in accordance with AASHTO T 148, except that measurement will be taken to the nearest one-thousandth of an inch; and the average of such measurements will be taken to the nearest one-hundredth of an inch. Take thickness core samples after completion of corrective work, e.g., diamond grinding, diamond grooving.

The Engineer will remove non-PCC pavement materials from the bottom of the core before determining pavement thickness.

Thickness core samples will be evaluated on basis of primary and secondary units. A primary pavement unit is defined as that area of mainline pavement placed in each day's paving operations, but not to exceed 1,300 square yards. Each ramp, including tapers, each intersection, and each crossover will be considered as separate primary units. Drill one core for

each primary unit.

A secondary pavement unit is defined as 1,000 linear feet, or fraction thereof, of each mainline traffic lane, or a shoulder in each primary unit. Additionally, every 1,300 square yards of pavement in ramps, tapers, intersections, and crossroads will be considered secondary units, regardless of when concrete was placed. Drill one core for each secondary unit.

When the primary or secondary unit core is deficient by more than 0.2 inches but less than 0.6 inches, drill two additional cores within the same unit. The length of the initial and two additional cores will be averaged.

When the primary of the secondary unit core is deficient by more than 0.6 inches, that core will not be used to determine the average thickness of the primary or secondary unit. Drill additional cores at intervals not exceeding 10 feet in each direction from the deficient core, measured parallel to the centerline, until one core is obtained in each direction, which is not deficient by more than 0.6 inches. Pavement thickness between these two additional cores will be evaluated separately from the balance of pavement in that lot.

Pavement limits for separate evaluation will be longitudinal weakened plane or construction joint on each side of the core and next transverse weakened plane, construction, or expansion joint, beyond each of the last two cores. Unless the Engineer allows pavement within evaluation limits to remain, remove and replace with a pavement of specified thickness, at no increase in the contract price or contract time. Drill one additional core in the remaining portion of the primary or secondary unit. That portion will be evaluated separately for payment in accordance with provisions specified in Subsection 411.05 - Payment.

After replacing deficient pavement, drill one core at random in the primary or secondary unit beyond the limits of replaced pavement and drill one core in the replaced pavement. The Engineer will evaluate for payment, pavement represented by core taken beyond limits of replaced pavement in accordance with provisions specified in Subsection 411.05 - Payment.

Before filling, apply epoxy grout conforming to Subsection 712.04(B) - Epoxy Grout to core holes. Fill core holes completely with concrete accepted by the Engineer.

(U) Certified Concrete Flatwork Finisher Requirement. Perform the placement and finishing operations of concrete flatwork with a minimum ratio of one certified ACI Concrete Flatwork Finisher and Technician with 4,500 hours of acceptable work experience (certified craftsman) per three concrete finishers (concrete finishers without ACI Concrete Flatwork Finisher and

Technician certification and 4,500 hours of acceptable work experience) at each location on the project site having flatwork done. The concrete flatwork must be under the direct supervision of a certified craftsman. Designate the certified craftsman who will be supervising and responsible for determining the quality of the finish of the concrete flatwork being performed. No flatwork must be performed without the required amount of certified craftsmen present.

(1) Flatwork concrete is defined as any concrete work that requires tools or machines to be used during the placement and finishing operations of concrete. Concrete flatwork includes concrete work that requires a specified finishing, smoothness, or rigid surface tolerances such as sidewalks, walkways, portland cement concrete pavement, concrete white-topping, girder seats, pier caps, bridge decks, on-grade concrete slabs, approach slabs, concrete overlays, and concrete repairs which exceed one square foot per day.

(2) Areas that are not considered flatwork concrete are the top of foundations or structures that will have backfill material placed directly on the concrete surface.

(3) Submit copies of the craftsman's current ACI certification 30 days before concrete flatwork begins for the Engineer's review and acceptance. The Engineer has the right to require the removal, replacement, retraining, and re-certification of a certified craftsman if that person does not, in the opinion of the Engineer, demonstrate the ability to place and finish concrete in accordance with the practices recommended in the ACI Concrete Flatwork Finisher Certification Program and to meet the finishing standards required by the Contract Documents.

(4) Any cost or impact to the contractor in providing, training, certification, retraining, replacement, or re-certification is incidental to the contract items that require concrete flatwork.

411.04 Measurement.

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

(B) The Engineer will not measure any joints, e.g., longitudinal, transverse, expansion, and contraction joints. They will be considered incidental and included in the cost of the concrete pavement.

411.05 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**
___ Inch Concrete Pavement	Cubic Yard

The Engineer will pay for:

(A) 80 percent of the contract bid unit price upon completion of furnishing and placing formed joints or cutting grooves in the pavement.

(B) 20 percent of the contract bid unit price upon completion of cleaning up, including removal of saw-cutting residue and passing the pavement smoothness test.

When the primary or secondary unit core's thickness is deficient by not more than 0.2 inches from the planned thickness, the Engineer will pay for that primary or secondary unit at 100 percent.

When the primary or average secondary unit core's thickness indicates pavement thickness is deficient by more than 0.2 inches but not more than 0.6 inches, the Engineer will determine the reduction in the unit price will be for that the primary or secondary unit. A further reduction of the unit price will be made, if applicable, for other deficiencies if any are applicable. The Contractor has the option to reject the reduced unit price and replace the non-compliant units with units built following an Engineer accepted remedial plan. The remedial repairs will be subject to all the acceptance testing as other portions of the pavement.

The Engineer will not pay for pavement allowed to remain with thickness deficiency greater than 0.6 inches. The Contractor has the option to reject the non-payment of the work and replace the non-compliant pavement with compliant pavement with pavement built following an Engineer accepted remedial plan. The remedial repairs will be subject to all the acceptance testing as other portions of the pavement. The repair area must be in no less than a block section, i.e., a panel section. A block or panel section is generally defined as a rectangular concrete piece of pavement that is bordered by transverse joints at the beginning and end and longitudinal joints on the sides.

When the Engineer determines that thickness-deficient areas warrant removal, remove and replace those areas with concrete having the thickness indicated in the Contract Documents. The remedial repairs will be subject to all the acceptance testing as other portions of the pavement. The irregularly shaped panels have joints on all sides. The Engineer, in special cases, may allow half of the panel to be replaced. If allowed the cut must be perpendicular to the longitudinal

joints and midway between the transverse joints. Irregularly shaped panels must be removed completely, no partial removal will be allowed.

When the profile index does not exceed 10, the Engineer will pay for the accepted pavement. When the profile index exceeds 10 the Contractor must diamond grind the surface to a profile index of 10 or less and then mechanically groove the ground pavement surface. It will not be acceptable to leave the diamond ground pavement surface without it being mechanically grooved to match the grooves outside the diamond ground remedial repaired areas.

The Engineer at its sole digression will determine the final adjusted unit price for non-compliant pavement. The adjusted price will be applied only to areas that have passed the acceptance profile test. The area of adjustment will be in blocks of a 0.1-mile section by its lane width represented by.

END OF SECTION 411

SECTION 415 – COLD PLANING OF EXISTING PAVEMENT

Make the following amendments to said Sections:

(I) Amend **Section 415.04 Measurement**, from line 67 to 68 to read as follows:

"415.04 Measurement.

The Engineer will measure cold planing per square yard in accordance with the contract documents."

(II) Amend **Section 415.05 Payment**, from line 70 to 79 to read as follows:

"415.05 Payment. The Engineer will pay for the accepted pay item 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**
Cold Planing	Square Yard

(1) 80 percent of the contract bid price upon completion of removing the indicated thickness and clean and sweep before opening to public traffic;

(2) 20 percent of the contract bid price upon completion of removing the material and disposing of the removed material."

END OF SECTION 415

SECTION 602 – Reinforcing Steel

Make the following amendments to said Section:

(I) Amend **602.02 – Materials** by adding the following after line 15:

"When placing WWF comply with the recommendations of ACI 302.1R, "Guide for Concrete Floor and Slab Construction,". Welded-wire fabric must not be laid on the ground and "pulled up" after the concrete is placed or "walked in" after placing the concrete or using small piles of fresh concrete. Use supports tied to the WWF, e.g., precast concrete spacer blocks to maintain the proper elevation of the WWF. Plastic spacers must not be used. The number of precast concrete spacer blocks must be used in a quantity that will prevent sagging, bending, or bending when walked upon, and still, maintain the required clearances."

(II) Amend **602.04 – Measurement** by revising lines 803 to 809 to read as follows:

"**602.04 Measurement.** Reinforcing steel will be measured by the pound, based on the theoretical number of pounds complete in place as shown on the plans or placed as ordered as specified in the proposal.

The Engineer will base the weights calculated upon Table 602.04-1 – Bar Designation, Weight and Area.

TABLE 602.04-1 – BAR DESIGNATION, WEIGHT AND AREA

Bar No.	Weight Per Linear Foot (Pounds)	Area (Square Inches)
3	0.376	0.11
4	0.668	0.20
5	1.043	0.31
6	1.502	0.44
7	2.044	0.60
8	2.670	0.79
9	3.400	1.00
10	4.303	1.27
11	5.313	1.56

14	7.650	2.25
18	13.600	4.00

The Engineer will not make allowance for clips, wire or other material used for fastening reinforcement in place. The cost is for the work prescribed in this section and the contract documents.

The Engineer will not measure mesh reinforcement."

(III) Amend **602.05 – Payment** by revising lines 810 to 830 to read as follows:

"**602.05 Payment.** The Engineer will pay for the accepted reinforcing steel at the contract unit price per pound.

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

Pay Item	**Pay Unit**
Reinforcing Steel for _____	Pound

END OF SECTION 602

SECTION 606 – GUARDRAIL

Make the following amendment to said Section:

(I) Amend **606.02 - Materials** by adding the following after line 23:

"All concrete must comply with the CO2 footprint reduction requirements in Section 601 Structural Concrete."

(II) Amend **606.04 - Measurement** by replacing lines 116 to 118 to read:

"**606.04 Measurement.** The Engineer will measure guardrail per linear foot in accordance with the contract documents.

The Engineer will measure from center to center of end posts. If the Contractor makes end connections to masonry or steel structures, the Engineer will measure to the face of such structures.

The Engineer will measure end section per each when specified in the proposal.

The Engineer will not measure removal and disposal of guardrail. Removal and disposal of existing guardrail will be considered incidental and included in the cost of the various contract items."

(III) Amend **606.05 – Payment** by revising lines 120 to 138 to read as follows:

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

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

Pay Item	Pay Unit
Guardrail Type 31" W-Beam with Standard 8" Offset Block	Linear Foot
Guardrail W-Beam End Section _____	Each"

END OF SECTION 606

Amended **Section 622 - Roadway and Sign Lighting System** to read as follows:

"SECTION 622 - ROADWAY AND SIGN LIGHTING SYSTEM

622.01 Description. This work includes furnishing and installing a roadway lighting system, including materials necessary for operating and controlling roadway lighting system, and pole foundations.

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

622.02 Materials. Materials shall conform to the following:

Conduits	712.27
Luminaires for Roadway Lighting	761.01
Cables and Wires for Roadway Lighting System	761.02
Disconnect and Protective Devices	761.03
Waterproof Connectors for Roadway Lighting	761.04
Outdoor Wireless Control System	761.05

Concrete shall conform to Section 601 - Structural Concrete and shall be Class A. Class A must comply with the CO2 footprint reduction requirements in Section 601 Structural Concrete.

Stainless steel anchor bolts, nuts, and steel plate covers shall be structural steel conforming to ASTM F593, F594 and A 36 respectively.

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

622.03 Construction Requirements.

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

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

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

(B) Excavation and Backfill. Excavation and backfill shall conform to Section 204 - Excavation and Backfill for Miscellaneous Facilities.

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

(C) Installation.

(1) Luminaires. Install the roadway lighting luminaires on mast arms with the vertical axis perpendicular to the roadway and longitudinal axis parallel to the roadway centerline.

(2) Circuits. Encase the cables installed underground in conduits.

Before installing the wires and cables in conduits, pull a wire brush, swab and mandrel through each conduit for the removal of extraneous matter and verification of the absence of obstructions and debris from the conduit system.

Pull the cables directly from their cores or reels into the conduits. Do not pull off and lay the cable on the ground before installation. Make the pulls in one direction only. Lubricants used shall be as recommended by the cable manufacturer or accepted by the Engineer.

Do not leave wires or cables under tension nor tight against bushings or fittings. Remove damaged ends resulting from the use of pulling grips soon after pulling the cable. Maintain the cable end seals. Do not pull open-ended cables through the conduits. Cables shall be continuous from pulling point to pulling point. The Engineer will not permit splices from pulling point to pulling point. Make splices, taps and terminations with pressure-indented connectors or lugs as appropriate or specified in the contract.

When requiring splicing, join the conductors by a 'western union' type splice or by using an accepted connector. Use the connectors for splicing conductors, No. 8 AWG or larger. Solder the "western union" type splice by the pouring or dipping method. Cable splices and termination shall be according to the cable manufacturer's recommendation. Submit the cable manufacturer's splicing instruction sheets for acceptance.

Trim the conductor insulation to a conical shape. Roughen the conductor insulation before applying splice insulation. Splice insulation includes layers of thermoplastic electrical insulating tape not over 0.007 inches thick conforming to Federal Specification MIL-7798. Apply the splice insulation a thickness equal to and well lapped over the original insulation. Leave at least 2 feet of slack for each conductor at each splice.

(3) Bonding and Grounding. Secure the metallic cable sheaths, conduits and lamp posts mechanically and electrically to form a continuous system. Ground them effectively as specified in the Code and in the contract.

(4) Conduits. Lay the polyvinyl chloride (PVC) conduits carefully in trenches prepared to receive the conduits. Use PVC Schedule 80 conduits, direct buried, in area not exposed to traffic.

Install the PVC coated galvanized rigid steel conduit according to Article 344 of the Code. Use PVC coated galvanized rigid steel for transitions from below grade to above grade and for exposed conduit within 2'-0" of grade Use white and tinted ready-mixed paint on the threads of joints. Repair zinc-coated surfaces according to Subsection 501.03(G)(2) - Repairing Damaged Zinc-Coated Surfaces.

Install rigid PVC conduit according to Article 354 of the Code PVC conduit connections shall be of the solvent-weld type. Make solvent-weld joints according to the conduit manufacturer's recommendations and as accepted by the Engineer. The Engineer will permit pre-assembling sections of conduit.

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

Thread the fittings for connecting non-metallic conduits to rigid metal conduits on the side that will be connected to the metal conduit. Metal conduits entering pullboxes shall end in insulating grounding bushings. Non-metallic conduits shall end in end bells.

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

(E) Photometric Data. Contractor shall submit photometric curve data for each luminaire type. Luminaire performance shall meet the photometric curves shown in the drawings, using the criteria indicated.

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

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

(1) Test for continuity of each circuit.

(2) Test for grounds in each circuit.

(3) A megger test on each circuit between the circuit and ground. The insulation resistance shall not be less than the values specified in Table 622-I-INSULATION RESISTANCE when measured with an instrument having a voltage rating of 500 volts.

TABLE 622-I - INSULATION RESISTANCE

Cable or Circuit	Minimum Resistance (ohms)
No.14 - No.12 wire	1,000,000
25 to 50 amperes	250,000
51 to 100 amperes	100,000
101 to 200 amperes	50,000
201 to 400 amperes	25,000
401 to 800 amperes	12,000
over 800 amperes	5,000

(4) A functional test to show that each part of the system functions according to the contract.

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

(H) Removing Electrical Equipment. The contract directs the Contractor to Section 202 - Removal of Structures and Obstructions, regarding existing highway facilities including items listed here. When shown in the contract or specified by the Engineer, remove and dispose of existing electrical equipment including luminaires, standards, foundations, mast arms, ballasts, transformers, service equipment, overhead cables and pullboxes at no cost to the State.

622.04 Method of Measurement. The Engineer will not measure roadway lighting systems, lighting systems on structures, modifying systems, temporary systems, or removing systems when contracted on a lump sum basis.

622.05 Basis of Payment. The Engineer will pay for the accepted roadway lighting standard and power system at the contract lump sum. The price includes full compensation for submitting the equipment list and drawings; modifying or removing the systems, excavating and backfilling, furnishing and installing the roadway lighting standards and power system to include lighting control equipment, electrical apparatus, pullboxes, conduit, conductors, and pole foundations including reinforcing steel; submitting warranty; and furnishing equipment, tools, labor, materials and other incidentals necessary to complete the work.

Hauling and stockpiling of salvaged materials and equipment off the right-of-way to the locations specified by the Engineer shall be incidental to the contract work.

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

Pay Item	**Pay Unit**
Roadway Lighting System	Lump Sum

END OF SECTION 622"

Make this Section a part of the Standard Specifications :

"SECTION 627 – CATHODIC PROTECTION SYSTEM

627.01 Description. This work consists of providing a complete cathodic protection (CP) system for ductile iron water lines with a bonded dielectric coating as outlined in this Section and on the Drawings.

The CP system design is dependent on the ductile iron pipelines having a bonded dielectric coating per the Board of Water Supply (BWS) Water System External Corrosion Control Standards. If the ductile iron pipelines do not have a bonded dielectric coating, this may impact the operation of the CP system.

Electrical isolation of the pipelines from adjacent metallic structures, steel reinforced concrete structures, casings, structures of dissimilar metal or dissimilar coatings, copper laterals, conduits, and all other metallic components that may impact the operation of the CP system.

Electrical bonding of all non-insulated, non-welded pipe joints and mechanical joints to provide electrical continuity.

Installation of galvanic anodes, insulating joints, test stations, other components associated with the CP system, and all other WORK described herein and on the Drawings.

Testing of CP system during installation.

Cleanup and restoration of WORK site.

System Commissioning: Testing of CP system after installation and backfilling.

627.02 Materials. Materials shall conform to the following:

Portland Cement	701.01
Aggregates	703
Ductile Iron Pipe	707.01
Paints	708
Reinforcing Steel	709.01

The condition of materials will be subject to inspection for acceptance before or during incorporation of materials into the work.

627.03 Construction Requirements

(A) Defects. If the products installed as part of this Section are found to be defective or damaged or if the WORK of this Section is not in conformance with these Specifications, then the products and WORK shall be corrected at the CONTRACTOR's expense.

(B) Retesting. Any retesting required due to inadequate installation, failure to meet performance or acceptance criteria, or due to defective materials shall be paid for by the CONTRACTOR at no additional cost to the OWNER.

(C) The WORK also requires that one Supplier or Subcontractor accept responsibility for the WORK, as indicated, but without altering or modifying the CONTRACTOR's responsibilities under the Contract Documents.

(D) The WORK also requires coordination of assembly, installation, and testing between the pipeline contractor and any CP material supplier or subcontractor.

(E) Applicable Standards. The WORK of this Section shall comply with the current editions of the codes and standards referenced in this specification, including the following:

a. American Association of State Highway and Transportation Officials (AASHTO), H20 Specification for Highway Bridges

b. ASTM International (ASTM):
   i. A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
   ii. B3 - Standard Specification for Soft or Annealed Copper Wire
   iii. B8 - Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
   iv. B80 - Standard Specification for Magnesium-Alloy Sand Castings
   v. B187 - Standard Specification for Copper, Bus Bar, Rod, and Shapes and General-Purpose Rod, Bar, and Shapes
   vi. B418 - Standard Specification for Cast and Wrought Galvanic Zinc Anodes

vii. B843 - Standard Specification for Magnesium Alloy Anodes for Cathodic Protection
viii. C94 - Standard Specification for Ready-Mixed Concrete
ix. D1000 - Standard Test Methods for Pressure-Sensitive Adhesive-Coated Tapes Used for Electrical and Electronic Applications
x. D1248 - Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
xi. D1785 - Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
xii. D2220 - Standard Specification for Poly (Vinyl Chloride) Insulation for Wire and Cable, 75°C Operation
xiii. D3005 - Standard Specification for Low-Temperature Resistant Vinyl Chloride Plastic Pressure-Sensitive Electrical Insulating Tape
xiv. D4388 - Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes
xv. D6386 - Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting
xvi. G97 - Standard Test Method for Laboratory Evaluation of Magnesium Sacrificial Anode Test Specimens for Underground Applications

c. American Water Works Association (AWWA), C217, Petrolatum and Petroleum Wax Tape Coatings for the Exterior of Connections and Fittings for Steel Water Pipelines

d. National Sanitation Foundation (NSF), NSF 61, Drinking Water System Components

e. NACE International, The Corrosion Society:
i. SP0375 - Field-Applied Underground Wax Coating Systems for Underground Pipelines: Application, Performance, and Quality Control
ii. SP0169 - Control of External Corrosion on Underground or Submerged Metallic Piping Systems
iii. SP0286 - Electrical Insulation of Cathodically Protected
iv. TM0497 - Measurement Techniques Related to Criteria for Cathodic Protection on Underground or Submerged Metallic Piping Systems

f. National Electrical Manufacturers Association:
i. TC2 - Electrical Polyvinyl Chloride (PVC) Tubing and Conduit

ii. TC3 - PVC Fittings for Use with Rigid PVC Conduit and Tubing

g. National Fire Protection Association, NFPA 70 – National Electric Code (NEC)

h. Underwriters Laboratories (UL):
   i. 6 - Rigid Metal Conduits
   ii. 467 - Grounding and Bonding Equipment
   iii. 506 - Standard for Specialty Transformers
   iv. 514B - Fittings for Cable and Conduit

Whenever the Drawings or these Specifications require a higher degree of workmanship or better quality of material than indicated in the above codes and standards, these Drawings and Specifications shall prevail.

(F) Permits and Access.

a. Prior to the start of construction, the CONTRACTOR shall apply to the required authorities for permits required for installation of the CP system.

b. The CONTRACTOR shall contact Hawaii One Call prior to commencing construction to locate existing utilities in the area of construction. Existing utilities include, but are not limited to, water lines, gas lines, telephone, streetlights, sewer and storm drains, and overhead and underground electric utilities.

(G) Quality Assurance.

a. Installation of the CP equipment shall be performed by individuals having at least five years of experience in the installation of the CP equipment described herein.

b. All testing required to be performed by a "Corrosion Technician" shall be performed by a NACE certified Corrosion Technician under the supervision of a Corrosion Engineer. A Corrosion Technician is a minimum of a NACE CP2 (CP Technician). A Corrosion Engineer is a Registered Professional Corrosion Engineer or a NACE CP4 (CP Specialist).

(H) Submittals.

a. The following shall be submitted to the ENGINEER prior to any equipment installation.

i. A copy of this specification section, with addenda updates, with each paragraph check-marked, to show specification compliance or marked to show deviations.

ii. Catalog cuts, bulletins, brochures, or data sheets for all materials specified herein.

iii. Statement that the equipment and materials proposed meet the Specifications and the intent of the Specifications.

iv. Statement of installation and testing experience required.

v. Schedule, including the expected start date and planned completion date.

vi. Manufacturer's anode connection resistance test results.

vii. CONTRACTOR's System Commissioning Test Plan and Procedures. The test plan shall outline the organization, schedule, allocation of resources, and documentation requirements associated with the commissioning tests.

b. The following shall be submitted to the ENGINEER after completion of the WORK.

i. Wire connection testing.

ii. Insulating joint testing, before and after backfilling.

iii. Electrical isolation testing from structures or rebar.

iv. Joint bond testing, before and after backfilling.

v. System Commissioning Report documenting all test results. The test report shall include the findings, results, and comments derived from the commissioning tests.

vi. Record Drawings shall be submitted to and approved by

the ENGINEER before the WORK is considered complete.prior to any equipment installation.

(I) Interference and Exact Locations.

a. The locations of CP equipment, test stations, devices, outlets, and appurtenances, as indicated, are approximate only. Exact locations shall be determined by the CONTRACTOR in the field subject to the approval of the ENGINEER.

b. The CONTRACTOR shall field verify all data and final locations of WORK done under other Sections of the Specifications required for placing of the electrical work.

c. In case of interference with other work, foreign pipeline, or erroneous locations with respect to equipment or structures, the CONTRACTOR shall furnish all labor and materials necessary to complete the WORK in an acceptable manner to the OWNER. Deviations from the Drawings and Specifications shall be submitted to the OWNER for approval.

(J) Products.

a. General.

i. All materials installed must be new. All equipment and materials supplied shall be similar to that which has been in satisfactory service for at least 5 years.

ii. All materials in contact with potable water shall be NSF 61 approved.

b. Galvanic Anodes

i. High-potential magnesium anodes: Cast magnesium anodes shall conform to ASTM B843 Type M1C. Anodes shall have an open circuit potential of −1.70 volts or more electronegative and a current efficiency of at least 48% when tested in accordance with ASTM G97. Anodes shall have the following size, form, and shape. Anodes shall be supplied by Farwest, Corrpro, Mesa, Matcor, or an approved equivalent.

Ingot				Packaged		
Weight (lb)	Width (inch)	Height (inch)	Length (inch)	Weight (lb)	Diameter (inch)	Length (inch)
60	4 to 5	4	60	126 to 130	6 to 7	64

ii. Galvanic anodes shall be pre-packaged in a cloth bag containing backfill of the following composition: 75% gypsum, 20% bentonite, and 5% sodium sulfate. The anodes shall be of the size indicated on the Drawings and placed where indicated on the Drawings.

iii. Anode lead wire:

1. The wire attached to the anodes shall be of the size and type indicated on the Drawings. The anode lead wire shall conform to the specifications given for "Wires" in this specification.

2. Connection of wire to the anode shall have a pulling strength that exceeds the wire's tensile strength.

3. Anode lead wires shall be of one continuous length, without splices, unless otherwise indicated on the Drawings, from the anode connection to the test station.

c. Ready-Mixed Concrete. Ready-mixed concrete shall be in accordance with ASTM C94, permit requirements, and the Specification section for cast-in-place concrete.

d. Reinforcing Steel. Reinforcing steel shall be in accordance with ASTM A615, permit requirements, and the Specification section for reinforcing steel.

e. Flush-Mounted Test Station.

i. Flush-mounted test station boxes shall be traffic boxes rated to withstand AASHTO H20 traffic loading.

ii. The traffic boxes shall be G05 Utility Boxes, as manufactured by Christy Concrete Products, Inc.; No. 3RT Traffic Valve Box, as manufactured by Brooks Products; or an approved equivalent.

iii. Traffic box covers for test stations shall be cast iron with

welded bead legend and labeled “CP TEST” or “ANODE,” as required.

f. Terminal Boards.

i. Terminal boards shall be made of 1/4 inch thick phenolic plastic and sized as indicated on the Drawings.

ii. Connection hardware shall be brass or bronze. All connections shall be double nutted bolts with serrated lock washers.

iii. Copper bus bar shall be 1/8 inch thick and sized to fit. The copper bus bar shall be per ASTM B187 with 98% conductivity.

g. Mechanical Lugs. Mechanical lugs shall be brass or copper with a brass, copper, or stainless-steel set screw. Tin plating on the lugs is optional. Aluminum lugs shall not be permitted. Zinc plated steel set screws shall not be permitted. The lug shall be listed per UL 467, suitable for direct burial, and appropriately sized for the incoming wires. The lug shall be ILSCO Type XT 6DB, Burndy GKA8C, or an approved equivalent.

h. Shunts.

i. Shunts shall be selected by the size indicated on the Drawings.

ii. 0.01-ohm, 6-amp shunts shall be manganin wire type, as indicated. Shunts shall be Type RS, as manufactured by Holloway, or an approved equivalent.

i. Conduit and Fittings.

i. The minimum conduit size shall be 1 inch unless otherwise indicated. Refer to NFPA 70 (NEC) for additional conduit size requirements.

ii. Conduit and fittings placed below grade shall be Schedule 80 PVC in accordance with NEMA TC2 and NEMA TC3.

iii. Conduit and fittings placed above grade shall be rigid steel. Rigid Steel conduit shall be galvanized and conform to UL 6.

iv. Conduit clamps shall be galvanized steel, 304 stainless steel, or 316 stainless steel.

v. Fittings for use with rigid steel conduit shall be galvanized cast ferrous metal, with gasket covers, Crouse-Hinds Condulets, Appleton Unilets, or an approved equivalent. Rigid metallic conduit fittings shall be galvanized, conform to NEMA FB 1, and listed to UL 514B.

vi. Union couplings for conduit shall be Erickson or Appleton Type EC, 0 Z Gedney 3 piece Series 4, or an approved equivalent.

vii. Non-metallic insulating end bushings shall be used at conduit terminations regardless of the conduit material used and shall conform to NFPA 70 (NEC). Insulating bushings shall be Emerson Type A for threaded ended conduits, Arlington fit-in for non-threaded conduits, or approved equivalents.

j. Caution Tape.

i. The caution tape shall be an inert plastic film designed for prolonged underground use. The caution tape shall be a minimum of 3 inches wide and a minimum of 4 mils thick.

ii. The caution tape shall be continuously printed over the entire length with the wording "CAUTION: CATHODIC PROTECTION CABLE BURIED BELOW."

iii. The wording shall be printed using bold black letters. The color of the tape shall be red.

k. Wires.

i. Conductors shall consist of stranded copper of the gauge indicated on the Drawings. Wire sizes shall be based on American Wire Gauge (AWG). Copper wire shall be in conformance with ASTM B3 and ASTM B8.

ii. Insulation Type and Colors: As shown on the Drawings.

iii. High molecular weight polyethylene (HMWPE) wires shall be rated for 600 volts and shall conform to ASTM D1248, Type 1, Class C, Grade 5.

l. Wire Identification Tags. Wire identification tags shall be the wrap-around type with a high resistance to oils, solvents, and mild acids. Wrap-around markers shall fully encircle the wire with imprinted alpha numeric characters for pipe identification. The height of the letters and numbers shall be 3/16 inch at a minimum.

m. Exothermic Welds.

i. Exothermic welds shall be in accordance with the manufacturer's recommendations. Exothermic welds shall be Cadweld manufactured by Erico, Thermoweld manufactured by Burndy, or an approved equivalent.

ii. Prevent molten weld metal from leaking out of the mold, where necessary, by using Duxseal packing manufactured by Johns Manville, Thermoweld packing material manufactured by Burndy, Cadweld T403 Mold Sealer manufactured by Erico, or an approved equivalent.

iii. The shape and charge of the exothermic weld shall be chosen based on the following parameters and based on manufacturer recommendations:

1. Pipe material
2. Pipe size
3. Wire size and requirement for sleeves
4. Number of wires to be welded
5. Orientation of weld (vertical or horizontal)

n. Exothermic Weld Coating.

i. After exothermic welding, repair coatings and linings in accordance with the coating and lining manufacturer's recommendation.

ii. Weld caps with integrated primer shall be used to cover the exothermic weld connecting the wire to the pipe. The weld cap shall be a 10-mil thick durable plastic sheet that has a dome filled with a moldable compound to assure complete encapsulation of the exothermic weld and a layer of elastomeric adhesive with integrated primer. The adhesive and primer shall be compatible with the pipe material and pipe coating material. Adhesion to steel shall be at least 10 lb./in per ASTM D1000. Weld cap with integrated primer shall be Handy Cap IP manufactured by

Royston or an approved equivalent for wire size up to 8 AWG and Handy Cap XL IP manufactured by Royston or an approved equivalent for wire size up to 2 AWG.

o. Dielectric Insulating Flange Kits.

i. Insulating flange kits shall include full-faced gaskets, insulating sleeves and washers, and 316 stainless steel bolts, nuts, and washers. The complete assembly shall have a pressure rating equal to or greater than the flanges between which it is installed. Sleeves, gaskets, and insulating washers shall have a minimum dielectric constant of 300 volts per mil. Stainless steel washers shall fit well within the bolt facing on the flange.

Insulating washers shall fit within the bolt facing the flange over the outside diameter of the sleeve.

a) Insulating gasket shall be full-faced, Type E, and 1/8 inch thick. Acceptable gasket materials include nitrile-faced phenolic, G-10, or a material with approved equivalent or increased performance. Acceptable seal materials include EPDM, PTFE, or a material with approved equivalent or increased performance. When used in potable water systems, gasket and seal shall be NSF 61 approved.

b) Insulating sleeves shall be 1/32-inch thick and equal the number of bolts on the flange. Acceptable materials include Mylar, G-10, or a material with approved equivalent or increased performance.

c) Insulating washers shall be 1/8-inch thick and equal to twice the number of bolts on the flange. Acceptable materials include phenolic, G-10, or a material with approved equivalent or increased performance.

ii. Dielectric insulating flange kits shall be manufactured by Pipeline Seal and Insulator, Inc., Advance Products & Systems Inc., GPT Industries, or an approved equivalent.

iii. For bell and spigot pipe, provide electrical isolation through the installation of the following materials:

a) Flange connection to lock joint bell adapter.
b) Flange connection to lock joint spigot adapter.

p. Insulating Corporation Stops.

i. The insulating corporation stop shall be designed to provide electrical isolation between the main pipeline and copper service lateral.

ii. The insulating corporation stop shall have the same or better pressure rating and hydrostatic performance as the pipeline where it will be installed.

iii. The insulating corporation stop shall be brass with nylon insulating material. The seal shall be accomplished with an O-ring.

iv. Insulating corporation stops shall be manufactured and tested in accordance with AWWA C800 and certified to NSF 61.

v. Insulating corporation stops shall be manufactured by Mueller Co. or an approved equivalent.

q. Petrolatum Wax Tape.

i. Petrolatum wax tape shall meet or exceed the requirements of AWWA C217 and shall consist of three parts: Surface primer, wax tape, and outer covering. All three parts shall be the product of a single manufacturer and suitable for their operating environment.

ii. The primer shall be a blend of petrolatums, plasticizers, and corrosion inhibitors having a paste-like consistency. Primer shall be Wax-Tape Primer manufactured by Trenton, Denso Paste manufactured by Denso, or an approved equivalent.

iii. The wax tape shall be synthetic fiber felt, 45 to 90 mils thick, saturated with a blend of micro-crystalline wax, petrolatums, plasticizers, and corrosion inhibitors that are capable of easy conformability over irregular surfaces. Wax tape shall be #1 Wax-Tape manufactured by Trenton, Denso Tape manufactured by Denso, or an approved equivalent.

iv. The outer covering shall be a plastic wrap consisting of one 150-gauge sheet or three 50-gauge sheets wound together as a single sheet, clear polyvinylidene chloride, shrink wrap that is flexible enough to conform to irregular

surfaces. Outer wrapping shall be Poly-Ply by Trenton, Poly-Wrap by Denso, or an approved equivalent.

r. Coupon.

i. The coupon shall be the same material type as the pipeline and have an area of 10 cm2.

ii. The coupon shall have two #12 AWG stranded copper wires with HMWPE insulation (green). All wires shall be long enough to extend to the junction box or test station without splicing.

iii. Coupons shall be manufactured by MC Miller or an approved equivalent.

(K) Execution.

a. Material and Equipment Storage. All materials and equipment to be used in construction shall be stored in such a manner as to be protected from detrimental effects from the elements. If warehouse storage cannot be provided, materials and equipment shall be stacked well above ground level and protected from the elements with plastic sheeting or another method, as appropriate.

b. Excavation and Backfill.

i. Buried wires shall have a minimum cover of 30 inches.

ii. Caution tape shall be installed above the buried wire. Caution tape shall be installed a minimum of 6 inches above underground wires and conduits.

iii. Wire identification tags shall be placed on the wires prior to placing the wire in conduit or backfilling.

c. Surface Ground Bed for Galvanic Anodes.

i. Prepackaged anodes shall be installed at the locations indicated on the Drawings.

ii. Plastic or paper wrapping shall be removed from the anode prior to lowering the anode into the hole. Anodes shall not be suspended by the lead wires. Damage to the canvas bag, anode-to-wire connection, copper wire, or wire insulation before or during installation will require

replacement of the entire anode assembly. Anodes shall be inspected and approved prior to backfilling.

iii. Anodes shall be backfilled with native soil. Backfilling with native soil shall proceed in 6 inch lifts, compacting the soil around the anode during each lift, until the backfill has reached grade. Upon completion of compaction of backfill to the top of the anode, and prior to filling the hole and compacting the backfill to the surface, a minimum of 10 gallons of fresh water shall be poured into the hole to saturate the prepackaged anode backfill and surrounding soil.

iv. Anode lead wires shall be routed and terminated on the panel board as shown in the Drawings.

v. For lateral conduit runs, install wires in PVC conduit set at the center of the trench. Maintain sufficient slack in wire to prevent the cable from being unduly stressed or broken during backfill operations.

d. Test Stations.

i. Test stations shall be installed at the approximate locations shown on the Drawings. The CONTRACTOR shall field verify all final locations, subject to acceptance by the ENGINEER. Test stations shall be located within the pipeline easement. Test stations shall be located in areas not subject to vehicular traffic, such as sidewalks, unless otherwise approved by the ENGINEER. Where possible, locate test station near fire hydrants and place lateral wire runs along the hydrant lateral for protection.

ii. For flush-mounted test stations, place the bottom of the test box on native soil. Do not place rock, gravel, sand, or debris in the box. Install 4,000 psi concrete collar with reinforcement after placement of the test box to finished grade. Provide sufficient sloping in the concrete pad or surrounding pavement to provide drainage away from the test box.

iii. Connect wires to the terminal board as shown on the Drawings. Provide sufficient slack in wires (12 inches at minimum) to allow for pipe settlement, removal of the terminal board for testing, and future maintenance. Each wire shall be identified with a permanent wire identifier

within 4 inches of the termination. After installation, all wire connections in the test station shall be tested by the CONTRACTOR to ensure they meet the requirements herein.

iv. The CONTRACTOR shall provide global positioning system (GPS) coordinates for each test station location with a minimum accuracy of 1 meter or 3 feet. The CONTRACTOR shall submit the GPS coordinates of the test stations to the ENGINEER after installation.

e. Wires.

i. Buried wires shall be laid straight without kinks. Each wire run shall be continuous in length and free of joints or splices, unless otherwise indicated. Care shall be taken during installation to avoid punctures, cuts, or other damage to the wire insulation. Damage to insulation shall require replacement of the entire length of wire at the CONTRACTOR's expense.

ii. Wire shall not be bent into a radius of less than eight times the overall wire diameter.

iii. The wire conduits must be of sufficient diameter to accommodate the wires. This shall be determined by the number and size of wires in accordance with the applicable codes and standards.

iv. Conduit shall be installed to a minimum depth of 36 inches below grade.

v. Install caution tape a minimum of 6 inches above buried wire and conduits. Every 3 feet, double over the tape for a distance of 8 inches to increase the apparent flexibility of the tape.

vi. Use PVC conduit underground and galvanized rigid steel conduit above grade. The portion of galvanized steel conduit that is underground before it transitions to PVC shall be primed and tape wrapped along the entire length with half-lap, 10-mil polyethylene tape.

f. Wire Identification Tags.

i. All wires shall be coded with wire identification tags

within 4 inches of the wire end indicating diameter and type of pipe, structure, anode type and size, or reference electrode.

ii. Wire identification tags shall be placed on all wires prior to backfilling and installation of test stations.

g. Joint Bonds.

i. Joint bonding shall be provided across flexible couplings and all non-welded joints to ensure electrical continuity, except where insulating joints have been installed to provide electrical isolation. Joint bonds shall be of the type, size, length, and number shown on the Drawings and installed as indicated.

ii. Bonding wires shall allow at least 2 inches of movement in the pipe joint. The wire shall be attached by exothermic welding. At least 2 bond wires shall be provided between all discontinuous joints.

iii. For ductile iron pipe, the CONTRACTOR may, at his or her own expense, provide weld plates that are installed by the pipe manufacturer at the spigot end of the pipe. Provision of the weld plates does not relieve the CONTRACTOR from responsibility for repair of damage to the coating or lining as a result of exothermic welding of the pipe. Coating repairs shall be performed in accordance with the coating manufacturer's recommendations.

h. Exothermic Weld Connections.

i. Exothermic weld connections shall be installed in the manner and at the locations indicated. Exothermic welds shall be spaced at least 6 inches apart from other exothermic welds, fittings, and circumferential welds.

ii. Coating materials shall be removed from the surface over an area of sufficient size to make the connection and as indicated on the Drawings. The surface shall be cleaned to bare metal per SSPC SP11 prior to welding the conductor. The use of resin-impregnated grinding wheels will not be allowed.

iii. Only enough insulation shall be removed such that the copper conductor can be placed in the welding mold. If the wire conductor diameter is not the same as the opening in the mold, then a copper adapter sleeve shall be fitted over the conductor.

iv. The CONTRACTOR shall be responsible for testing all test lead and bond wire welds. The ENGINEER, at his or her discretion, shall witness these tests.

v. After the weld has cooled, all slag shall be removed, and the metallurgical bond shall be tested for adherence by the CONTRACTOR. A 22 ounce hammer shall be used for adherence testing by striking a blow to the weld. A weld that can be removed or compromised by the hammer blow shall be rejected. Care shall be taken to avoid hitting the wires. All defective welds shall be removed and replaced in a new location at least 6 inches away from the original weld location.

vi. All exposed surfaces of the copper and steel shall be covered with insulating materials. A plastic weld cap with integrated primer shall cover the exothermic weld and surrounding area. All surfaces must be clean, dry, and free of oil, dirt, loose particles, and all other foreign materials prior to application of the weld cap.

vii. The CONTRACTOR shall inspect both the interior and exterior of the pipe to confirm that all coatings and linings removed or damaged as a result of the welding have been repaired. The CONTRACTOR shall furnish all materials, clean surfaces, and repair protective coatings and linings damaged as a result of the welding. Repair of any coating or lining damaged during welding shall be performed in accordance with the coating or lining manufacturer's recommendations.

viii. After backfilling the pipe, all test lead pairs shall be tested for broken welds using a standard ohmmeter. The resistance shall not exceed 150% of the theoretical wire resistance, as determined from published wire data.

i. Dielectric Insulating Flange Kits.

i. All insulating components of the insulating flanged gasket set and mating surfaces shall be cleaned of dirt, grease, oil, and other foreign materials immediately prior to assembly. If moisture, soil, or other foreign matter contacts any portion of these surfaces, disassemble the entire joint and clean with a suitable solvent. Dry the entire joint. Once completely dry, reassemble the joint.

ii. Care shall be taken to prevent any excessive bending or

flexing of the gasket. Creased or damaged gaskets shall be rejected and removed from the job site at the CONTRACTOR's expense.

iii. Bolt holes in mating flanges shall be properly aligned at the time bolts and insulating sleeves are inserted to prevent damage to the insulation. Follow the manufacturer's recommended bolt tightening sequence. Center the bolt insulating sleeves within the insulation washers so that the insulating sleeve is not compressed and damaged.

iv. After flanged bolts have been tightened, each insulating washer shall be inspected for cracks or other damage. All damaged washers shall be replaced.

v. When the flange is determined to be properly functioning to the full satisfaction of the OWNER, approval will be granted to proceed with the installation. Do not proceed with coating, lining, or backfilling the insulating joint prior to gaining approval to proceed. If the coating or lining is applied prior to gaining approval to proceed, the coating or lining shall be completely removed and replaced to the satisfaction of the OWNER at the CONTRACTOR's expense. If the insulating joint is backfilled prior to gaining approval from the OWNER, the CONTRACTOR shall completely excavate the insulating joint at the CONTRACTOR's expense.

vi. After testing and acceptance by the OWNER, coat the exterior of the insulating flange with the petrolatum wax tape system specified herein for a minimum of three feet beyond the gasket with a minimum of six inches of overlap with the factory-applied coating on the pipeline.

vii. After testing and acceptance by the OWNER, line the interior of the insulating flange with the lining system that is compatible with the existing factory lining and recommended by the existing lining manufacturer. The coating shall comply with NSF 61. Follow the manufacturer's surface preparation and application procedures.

j. Insulating Corporation Stop.

i. An insulating corporation stop shall be installed where copper service laterals connect with the main pipeline. The insulating corporation stop shall be installed in accordance with the manufacturer's instructions. For buried installations, the

insulator and adjacent piping must be wrapped at least three feet in both directions from the insulator to prevent stray currents from traveling through the soil around the insulator. The wrap shall be a petrolatum wax tape in accordance with AWWA C217 and this specification.

ii. Care shall be taken to prevent excessive bending or flexing of the insulating corporation stop.

iii. Before and after installation, insulating corporation stops shall be inspected for damage. Damaged insulating corporation stops shall be rejected and removed from the job site.

iv. When the insulating corporation stop is determined to be properly functioning to the full satisfaction of the OWNER, approval will be granted to proceed with the installation. Do not proceed with backfilling the corporation stop prior to gaining approval to proceed. If the corporation stop is backfilled prior to gaining approval from the OWNER, the CONTRACTOR shall completely excavate the corporation stop at the CONTRACTOR's expense.

v. After testing and acceptance by the Manager, coat the exterior insulating corporation stop and pipe a minimum of 3 feet beyond the insulating corporation stop with the wax tape system specified herein.

k. Petrolatum Wax Tape.

i. Petrolatum wax tape systems shall be applied on insulating joints and non-cathodically protected metallic appurtenances and fittings, regardless of whether they are bare, or factory coated, as indicated in the Drawings. Extend the petrolatum wax tape coating system over any adjacent pipe coating by a minimum of 12-inches. Petrolatum wax tape systems shall be applied in accordance with NACE SP0375, AWWA C217, these Specifications, and the Manufacturer's recommendations.

ii. Surfaces shall be cleaned of all dirt, grease, oil, and other foreign materials immediately prior to coating. Loose rust, loose paint, and other foreign matter shall be removed in accordance with SSPC SP2 or SP3.

iii. A prime coating shall be applied in a uniform coating over the entire surface to be wrapped. A liberal coating shall be applied

to threads, cavities, shoulders, pits, and other irregularities. A filler putty or profiling mastic may be used for complex fittings to produce an acceptable surface for the application of the wax tape system.

iv. Petrolatum wax tape shall be applied immediately after applying the primer using a 1 inch overlap. A spiral wrap shall be used, and slight tension shall be applied to ensure that there are no air pockets or voids. For bolts, nuts, and other irregular shapes, cut strips of wax tape and apply them by gloved hand so that there are no voids or spaces under the tape. Apply a sufficient amount of tape to completely encapsulate all exposed steel surfaces. After applying the tape, the applicator shall firmly press and smooth out all lap seams and crevice areas. The tape shall be in tight intimate contact with all surfaces. The minimum wax tape thickness shall be 70 mils over smooth surfaces and 140 mils over sharp and irregular surfaces, or more as required to fill all voids.

v. Apply two layers of outer covering over the wax tape coating by tightly wrapping it around the pipe such that it adheres and conforms to the wax tape. Secure the outer covering to the pipe with adhesive tape.

l. Coupon. Coupon shall be installed as shown on the Drawings.

m. Restoration of Services.

i. Compaction of backfill for anodes and trenches shall match the existing conditions and shall be in conformance with the specification section for earth moving.

ii. RESTORATION OF SOD: Restore unpaved surfaces disturbed during the installation of anodes and wires to their original elevation and condition. Preserve sod and topsoil carefully and replace after the backfilling is completed. Replace sod that is damaged using sod of quality equal to that removed. Where the surface is disturbed in a newly seeded area, re-seed the area with the same quality and formula of seed as that used in the original seeding.

iii. RESTORATION OF PAVEMENT: Patch pavement, sidewalks, curbs, and gutters where existing surfaces are removed for construction in conformance with the specification section for asphalt paving and the specification section for cast-in-place concrete.

n. Continuity Testing.

i. Continuity testing of joint bonds shall be performed by the CONTRACTOR's qualified corrosion technician as defined in this section after backfilling. The electrical continuity test may additionally be performed before backfilling at the CONTRACTOR's option.

ii. The pipe shall be tested for electrical continuity. Continuity shall be verified using the linear resistance method. The pipe should be tested in spans that are no less than 250 feet, unless the pipe is shorter than 250 feet, and no more than 1,000 feet, if test station locations are available. Each test span shall have two test leads connected to the pipe at each end. Existing test stations can be used. A direct current shall be applied through the pipe using two of four test leads. The potential across the test span shall be measured using the other two test leads. The current applied and voltage drop shall be recorded for a minimum of three different current levels.

iii. The theoretical resistance of the pipe shall be calculated. It shall include the pipe wall thickness, material, and joint bonds.

iv. The average measured resistance shall be compared to the theoretical resistance of the pipe and bond wires. If the measured resistance is greater than 125% of the theoretical resistance, then the joint bonds shall be considered deficient and shall be repaired and retested at the CONTRACTOR's expense. If the measured resistance is less than 100% of the theoretical resistance, then the test and/or calculated theoretical resistance shall be considered deficient and the test span shall be retested and/or recalculated at the CONTRACTOR's expense. If the piping forms a loop, which allows current to flow both in and out of the test span, then consideration shall be made for current circulating through both the loop and the test span.

v. Alternative continuity testing methods can be submitted to the ENGINEER for consideration and approval.

o. Isolation Testing.

i. The CONTRACTOR shall test the performance of insulating joints before and after backfilling. The CONTRACTOR shall test the performance of insulating corporation stops before

backfilling. Insulating joints are used to electrically isolate two segments of the pipeline. Insulating corporation stops are used to electrically isolate the main pipeline from copper service laterals.

ii. Before backfilling, the CONTRACTOR shall test the integrity of the insulators using an above-ground insulator tester. Acceptable above-ground insulator testers are Gas Electronics Model No. 601 Insulation Checker, Miller Insulation Checker (M.I.C.) by M.C. Miller, Model RF-IT by Tinker & Rasor, or an approved equivalent. If the testing results indicate less than 100% insulation, then the insulators shall be repaired and retested at the CONTRACTOR's expense.

iii. After backfilling, testing shall be performed by measurement of native pipe to soil potentials on both sides of the insulator. If the difference in native pipe to soil potentials is greater than 100 mV, then the insulator shall be considered effective. If the difference in native pipe to soil potentials between pipe and casing is less than 100 mV, then additional testing shall be performed, as follows. Temporary CP current shall be applied to one side of the insulator. "On" and "Instant Off" pipe to soil potentials shall be measured on both sides of the insulator. If the "Instant Off" potential of the opposing side is more electronegative than its native potential, then the insulator is not effective and shall be repaired and retested at the CONTRACTOR's expense.

p. System Commissioning.

i. Upon completion of the installation, the CONTRACTOR shall provide testing of the completed system by a Corrosion Technician, and the data shall be reviewed by a Corrosion Engineer to ensure conformance with the Contract Documents, NACE SP0169, and NACE SP0286.

ii. The testing described herein shall be in addition to and not a substitution for any required testing of individual items at the manufacturer's plant and during installation.

iii. Testing shall be performed at all test leads of all test stations, junction boxes, and locations of the exposed pipe as soon as possible after installation of the CP system.

iv. Testing shall include the following and shall be conducted in accordance with NACE TM0497:

1. Measure and record native pipe-to-soil and anode-to-soil potentials at all test locations BEFORE the cathodic protection system is energized.

2. Verify electrical isolation at all insulating joints and insulating corporation stops per NACE SP0286.

3. Confirm electrical continuity of the cathodically protected pipeline in accordance with this Section.

4. Measure and record the "On" and "Instant Off" pipe to soil potentials at each location after the pipeline has been given adequate time to polarize.

5. Measure and record the current output of each anode when the CP system is initially turned on and again after it has been given adequate time to polarize.

v. Test results shall be analyzed to determine compliance with NACE SP0169.

vi. Test results shall be analyzed to determine if stray current interference is present. Stray current interference is defined as a ±50 mV shift in a pipeline's pipe-to-soil potential that is caused by a foreign current source. Stray current interference shall be tested on the project pipeline and foreign pipelines that have a reasonable chance of being affected by stray currents. Cooperative interference testing shall be coordinated with foreign pipeline and structure owners.

vii. The CONTRACTOR shall provide a written report, prepared by the Corrosion Engineer, documenting the results of the testing and recommending corrective WORK, as required to comply with the Contract Documents. Any deficiencies of systems tested shall be repaired and re-tested by the CONTRACTOR at no additional cost to the OWNER.

627.04 Method of Measurement. The Engineer will not measure the cathodic protection system when paid on a lump sum basis.

627.05 Basis of Payment. The Engineer will pay for the accepted cathodic protection system at the contract lump sum price complete in place. The price shall be full compensation for excavating; backfilling; installation of cathodic protection system, testing and commissioning; and furnishing labor, materials, equipment, tools, and other incidentals necessary to complete the work.

The Engineer will make payment under:

Pay Item	**Pay Unit**
Cathodic Protection System	Lump Sum"

END OF SECTION 627

SECTION 629 - PAVEMENT MARKINGS

Make the following amendments to said Section:

(I) Amend **Subsection 629.02 – Materials** by adding the following after line 22:

"Raised pavement markers must be used (Standard Plans TE-26) e.g., Type C, D, F, H must be MUTCD compliant and as specified in the Contract Documents. Type A markers must not be used. Temporary overlay markers e.g., Flexible temporary raised pavement markers, must not be used in place of raised markers shown on Standard Plans TE-26."

(II) Amend **Subsection 629.03(B) – Temporary Pavement Markings** by revising the second and third paragraph from line 57 to 63 to read:

"Install temporary, solid, 6-inch pavement marking tapes on edges of the traveled way for newly paved, scarified, or cold-planed surfaces, reconstructed areas, and unmarked areas. Where curbs are present at edges of the traveled way, 6-inch pavement marking tapes may be eliminated.

Maintain and replace temporary pavement markings, flexible delineators, and barricades."

(III) Amend **Subsection 629.03(B) – Temporary Pavement Markings** by adding the following after line 75:

"Flexible temporary raised pavement markers, must not be used in place of raised markers as shown on Standard Plans TE-26."

(IV) Amend **Table 629.03 – 1 – Temporary Pavement Markings** to read as follows:

"TABLE 629.03-1 TEMPORARY PAVEMENT MARKINGS	
TYPE	**PAVEMENT MARKINGS**
Passing Permitted - Both Sides	Single 4-inch yellow stripe 5 feet in length spaced 20 feet on center with Type D markers spaced 40 feet on center and located on center of 5-foot length of stripe.
Passing Prohibited - Both Sides	Double solid 4-inch yellow stripes with Type D markers placed 20 feet on center on one of 4-inch yellow stripes selected by the Engineer.
Passing Permitted - One Side Only	Single continuous 4-inch yellow stripe with Type D markers placed on stripe 20 feet on center on no-passing side and single 4-inch yellow stripes 5 feet in length spaced 20 feet on center on

	passing side.
Lane Lines - Lane Changing Permitted	Single 4-inch yellow or white stripe 5 feet in length spaced 20 feet on center with Type C or Type D markers spaced 40 feet on center.
Lane Lines - Lane Changing Prohibited	Double solid 4-inch white stripes with Type C markers placed 20 feet on center on one of the 4-inch white stripes selected by the Engineer.
Crosswalk	Two 12-inch white transverse lines spaced 8 feet on center or as ordered by the Engineer.
Stop Line	Single 12-inch white transverse line.
Note: Paint may be used for temporary markings in areas where final paving is not complete."	

(V) Amend **Subsection 629.03(C)(3)(b) – Application** by revising the first and third paragraph from line 206 to 208 and 214 to 219 to read:

"**(b) Application**. Clean off dirt, debris, blaze, paint, tape, oil, grease, and other material deleterious to the bonding of the pavement markers to the pavement surface."

""On concrete pavements, or on HMA pavements more than seven days old, or on HMA pavements paved within seven days containing less than 6 percent bituminous asphalt, pre-stripe application area with binder material, primer, or prime seal coat recommended by pavement marker's manufacturer and accepted by the Engineer."

(VI) Amend **Subsection 629.03(D) – Removal of Existing Pavement Markings** by adding the following after line 291:

"Areas, where pavement markings, temporary or permanent, have been removed, must match existing pavement, be matt, no depressions and should not look like a pavement marking when wet or the sun is low in the sky. The removal area must have the approximate appearance and friction of the existing pavement and have no trace of the previous pavement markings."

(VII) Amend **629.04 – Measurement** by revising lines 292 to 294 to read as follows:

"**629.04 Measurement.**

(A) The Engineer will measure thermoplastic and preformed pavement marking tape per linear foot in accordance with the contract documents. The longitudinal pavement markings will be measured per linear foot as a single stripe for the width specified in the contract and

in the proposal. The Engineer will include the longitudinal gaps for skip striping, up to thirty (30) feet long, in the measurement.

The Engineer will measure crosswalk markings by lane of traffic marked according to the contract.

The Engineer will not measure temporary pavement markings including flexible delineator posts with reflector makers or Type I Barricades and temporary signs installed for the longitudinal guidance of public traffic over reconstructed areas, cold planed surfaces, newly paved surfaces or other unmarked or scarified areas for payment.

The Contractor shall consider the work required for the removal of pavement markings incidental to the various contract items, except as provided in the proposal or elsewhere in the contract. If the contract stipulates that the Engineer will make payment for the removal of pavement markings, the Engineer will measure the removal of pavement markings.

(B) The Engineer will measure the pavement markers per each for the types shown in the proposal.

(C) The Engineer will measure the painted stripes that are twelve (12) inches wide or less as a single stripe. The Engineer will measure the painted stripes over twelve (12) inches wide as two (2) stripes. The Engineer will measure the double stripes that are twelve (12) inches or less in total width including the transverse space between the stripes as a single stripe.

The Engineer will measure the longitudinal pavement markings by the linear foot according to the contract. Longitudinal gaps for skip striping that are 30 feet or less will be included in the measurement.

(VIII) Amend **629.05 – Payment** by revising lines 296 to 330 to read as follows:

"**629.05 Payment.**

(A) The Engineer will pay for thermoplastic and preformed pavement marking tape at the contract price per linear foot according to the contract, complete in place, including primers.

The Engineer will pay for double four (4) inch striping with a four (4) inch space between stripes at the contract price per linear foot according to the contract.

The Engineer will pay for crosswalk markings at the contract price per lane of traffic marked according to the contract.

The Engineer will pay for pavement arrows (single and multiple heads), symbols, and words at the contract price per each according to the contract.

The contract unit price paid shall be full compensation for furnishing labors, materials, tools, equipment, and incidentals and for doing the work involved in furnishing and installing pavement markings complete in place according to the contract.

The Engineer will not pay for the temporary pavement markings including flexible delineator posts with reflector markers or Type I Barricades and temporary signs installed for the longitudinal guidance of public traffic over reconstructed areas, cold planed surfaces, newly paved surfaces or other unmarked or scarified areas for payment if not shown in the proposal separately. The Engineer will consider them incidental to the various contract items.

If the contract specifies payment for temporary pavement markings installed as ordered by the Engineer for special temporary traffic patterns, the Engineer will pay from an allowance for "Temporary Construction Zone Markings".

The Engineer will compute the actual amount paid to the Contractor for force account work according to Subsection 109.06 – Force Account Provisions and Compensation.

If the contact specifies payment for removal of pavement markings under unit price pay items, the Engineer will pay for the accepted quantities at the contract unit prices bid. The prices shall be full compensation for removing such items according to the contract.

(B) The Engineer will pay for the various types of pavement markers at the contract price per each according to the contract, complete in place, including adhesives.

(C) The Engineer will pay for painted pavement striping at the contract price per linear foot according to the contract.

The Engineer will pay for quantities of crosswalk marking at the contract price per lane of traffic marked according to the contract.

The Engineer will pay for pavement arrows (single or multiple arrow heads), symbols, and words at the contract price per each according to the contract.

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

Pay Item	Pay Unit
_____ - Inch Pavement Striping (Type ___ Tape or Thermoplastic)	Linear Foot
Crosswalk Marking (Tape, Type III or Thermoplastic)	Lane
Pavement Arrow (Paint, Type I Tape, or Thermoplastic)	Each
Pavement Symbol (Paint, Tape, Type I Tape or Thermoplastic)	Each
Type ____ Pavement Marker	Each

END OF SECTION 629

SECTION 630 – TRAFFIC CONTROL GUIDE SIGNS

Make the following amendment to said Section:

(I) Amend **Section 630.02 - Materials**, by replacing lines 28 to 29 to read:

"Retroreflective sheeting shall conform to criteria listed in ASTM D 4956 for the applicable type and class, or as amended in accordance with Subsection 750.01 - Signs."

(II) Amend **Section 630.04 - Measurement**, by replacing lines 204 to 221 to read:

"**630.04 Measurement.** The Engineer will measure destination, expressway, directional and exit number sign panels by the square foot of sign face.

The Engineer will measure destination and ground mounted expressway sign ("E" Designation) posts per each.

Measurement of contract items for construction of footings for overhead mounted expressway signs will be as follows:

(1) The Engineer will measure excavation according to Section 204 – Excavation and Backfill for Miscellaneous Facilities.

(2) The Engineer will measure concrete according to Section 503 – Concrete Structures. All concrete must comply with the CO2 footprint reduction requirements in Section 601 – Structural Concrete.

(3) The Engineer will measure reinforcing steel according to Section 602 – Reinforcing Steel.

When the Engineer accepts an alternative design, the method of measurement for the various contract items affected by the design shall be identical with the various original contract items shown in the contract. The Engineer will not measure the additional items that the Contractor requires for the alternate design.

The Engineer will not measure removal and disposal and storing of existing and temporary signs and markers that the Contractor will not incorporate in the completed highway for payment."

(III) Amend **630.05 – Payment** by revising lines 223 to 303 to read as follows:

"**630.05 Payment.** The Engineer will pay for destination, expressway, directional and exit number sign panels at the contract price per square foot for the type specified complete in place. Payment will be full compensation for the work prescribed in this section and the contract documents.

The Engineer will pay for destination and ground mounted expressway sign ("E" designation) posts at the contract price per each for the type specified complete in place. Payment will be full compensation for the work prescribed in this section and the contract documents.

The Engineer will not pay for removing and disposing or storing of existing and temporary signs that the Contractor will not incorporate in the completed highway separately. The Engineer will consider them incidental to the various contract items.

The Engineer will not make payment other than those specified herein for the construction of footings for overhead mounted expressway signs. The Engineer will pay for the work, materials, tools, equipment and incidentals required in the construction of the footings for overhead mounted expressway signs under the following contract items:

(1) Footing Excavation. The Engineer will make payment for footing excavation according to Section 204 – Excavation and Backfill for Miscellaneous Facilities.

(2) Concrete. The Engineer will make payment for concrete in footings according to Section 503 – Concrete Structures.

(3) Reinforcing Steel. The Engineer will make payment for reinforcing steel according to Section 602 – Reinforcing Steel.

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

Pay Item	Pay Unit
Panel for _____	Square Foot
_____ Post for _____	Each

When the Engineer accepts an alternate design, the total amount paid shall be full compensation for furnishing and installing materials and furnishing equipment, tools, labors, and incidentals necessary to complete the work. The Engineer will not make payment for additional materials, equipment, tools, labor

and other incidentals that might become necessary to complete the installation due to the alternate design.

END OF SECTION 630

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

"General Decision Number: HI20220001 09/30/2022

Superseded General Decision Number: HI20210001

State: Hawaii

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

Counties: Hawaii Statewide.

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

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least $15.00 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2022.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least $11.25 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2022.

|_____|_____|

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at https://www.dol.gov/agencies/whd/government-contracts.

Modification Number	Publication Date
0	01/07/2022
1	01/14/2022
2	02/18/2022
3	02/25/2022
4	03/04/2022
5	03/11/2022
6	03/18/2022
7	03/25/2022
8	04/15/2022
9	07/08/2022
10	08/19/2022
11	08/26/2022
12	09/02/2022
13	09/09/2022
14	09/30/2022

ASBE0132-001 06/05/2022

	Rates	Fringes
Asbestos Workers/Insulator Includes application of all insulating materials, protective coverings, coatings and finishes to all types of mechanical systems. Also the application of firestopping material for wall openings and penetrations in walls, floors, ceilings and curtain walls	$ 42.80	25.85

BOIL0627-005 01/01/2021

	Rates	Fringes
BOILERMAKER	$ 37.25	31.25

BRHI0001-001 08/30/2021

	Rates	Fringes
BRICKLAYER		
Bricklayers and Stonemasons	$ 46.46	30.43
Pointers, Caulkers and Weatherproofers	$ 46.71	30.43

BRHI0001-002 08/30/2021

	Rates	Fringes
Tile, Marble & Terrazzo Worker		
Terrazzo Base Grinders	$ 42.59	32.57
Terrazzo Floor Grinders and Tenders	$ 41.04	32.57
Tile, Marble and Terrazzo Workers	$ 44.40	32.57

CARP0745-001 10/01/2021

	Rates	Fringes
Carpenters:		
Carpenters; Hardwood Floor Layers; Patent Scaffold Erectors (14 ft. and over); Piledrivers; Pneumatic Nailers; Wood Shinglers and Transit and/or Layout Man	$ 51.25	24.84
Millwrights and Machine Erectors	$ 51.50	24.84
Power Saw Operators (2 h.p. and over)	$ 51.40	24.84

CARP0745-002 10/01/2021

	Rates	Fringes
Drywall and Acoustical Workers and Lathers	$ 51.50	24.84

ELEC1186-001 08/22/2022

	Rates	Fringes

Electricians:
     Cable Splicers.....$ 60.51 30.90
     Electricians.....$ 53.55 30.69
     Telecommunication worker....$ 34.94 13.69

ELEC1186-002 08/22/2022

	Rates	Fringes
Line Construction:		
Cable Splicers	$ 60.51	30.90
Groundmen/Truck Drivers	$ 40.16	25.34
Heavy Equipment Operators	$ 48.20	28.43
Linemen	$ 53.55	30.69
Telecommunication worker	$ 34.94	13.69

ELEV0126-001 01/01/2022

	Rates	Fringes
ELEVATOR MECHANIC	$ 65.33	36.885+a+b

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

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

ENGI0003-002 09/03/2018

	Rates	Fringes
Diver (Aqua Lung) (Scuba))		
Diver (Aqua Lung) (Scuba) (over a depth of 30 feet)	$ 66.00	31.26
Diver (Aqua Lung) (Scuba) (up to a depth of 30 feet)	$ 56.63	31.26
Stand-by Diver (Aqua Lung) (Scuba)	$ 47.25	31.26
Diver (Other than Aqua Lung)		
Diver (Other than Aqua Lung)	$ 66.00	31.26
Diver Tender (Other than Aqua Lung)	$ 44.22	31.26
Stand-by Diver (Other than Aqua Lung)	$ 47.25	31.26
Helicopter Work		

Airborne Hoist Operator		
for Helicopter	$ 45.80	31.26
Co-Pilot of Helicopter	$ 45.98	31.26
Pilot of Helicopter	$ 46.11	31.26
Power equipment operator - tunnel work		
GROUP 1	$ 42.24	31.26
GROUP 2	$ 42.35	31.26
GROUP 3	$ 42.52	31.26
GROUP 4	$ 42.79	31.26
GROUP 5	$ 43.10	31.26
GROUP 6	$ 43.75	31.26
GROUP 7	$ 44.07	31.26
GROUP 8	$ 44.18	31.26
GROUP 9	$ 44.29	31.26
GROUP 9A	$ 44.52	31.26
GROUP 10	$ 44.58	31.26
GROUP 10A	$ 44.73	31.26
GROUP 11	$ 44.88	31.26
GROUP 12	$ 45.24	31.26
GROUP 12A	$ 45.60	31.26
Power equipment operators:		
GROUP 1	$ 41.94	31.26
GROUP 2	$ 42.05	31.26
GROUP 3	$ 42.22	31.26
GROUP 4	$ 42.49	31.26
GROUP 5	$ 42.80	31.26
GROUP 6	$ 43.45	31.26
GROUP 7	$ 43.77	31.26
GROUP 8	$ 43.88	31.26
GROUP 9	$ 43.99	31.26
GROUP 9A	$ 44.22	31.26
GROUP 10	$ 44.28	31.26
GROUP 10A	$ 44.43	31.26
GROUP 11	$ 44.58	31.26
GROUP 12	$ 44.94	31.26
GROUP 12A	$ 45.30	31.26
GROUP 13	$ 42.22	31.26
GROUP 13A	$ 42.49	31.26
GROUP 13B	$ 42.80	31.26
GROUP 13C	$ 43.45	31.26
GROUP 13D	$ 43.77	31.26
GROUP 13E	$ 43.88	31.26

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

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

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

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

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

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

GROUP 6: Boom Truck or Dual Purpose ""A""Frame Truck (over 5 tons); Combination Loader/Backhoe (up to and including 3/4 cu. yd.); Concrete Batch Plants (wet or dry); Concrete Cutter, Groover and/or Grinder (self-propelled unit on streets, highways, airports, and canals); Conveyor or Concrete Pump (Truck or Equipment Mounted); Drilling Machinery (not to apply to waterliners, wagon drills or jack hammers); Fork Lift (over 10 tons); Loader (up to and including 3 and 1/2 cu. yds); Lull High Lift (under 40 feet); Lubrication and Service Engineer (Mobile); Maginnis Internal Full Slab Vibrator (on airports, highways, canals and warehouses); Man or Material Hoist; Mechanical Concrete Finisher (Large Clary, Johnson Bidwell, Bridge Deck and similar); Mobile Truck Crane Driver; Portable Shotblast Concrete Cleaning Machine; Portable Boring Machine (under streets, highways, etc.); Portable Crusher; Power Jumbo Operator (setting slip forms, etc., in tunnels); Rollers (over 5 tons); Self-propelled Compactor (single engine); Self-propelled Pavement Breaker; Skidsteer Loader with attachments; Slip Form Pumps (Power driven by hydraulic, electric, air, gas, etc., lifting device for concrete forms); Small Rubber Tired Tractors; Trencher (up to and including 6 feet); Underbridge Personnel Aerial Platform (50 feet of platform or less).

GROUP 7: Crusher Plant Engineer, Dozer (D-4, Case 450, John Deere 450, and similar); Dual Drum Mixer, Extend Lift; Hoist and/or Winch (2 drums); Loader (over 3 and 1/2 cu. yds. up to and including 6 yards.); Mechanical Finisher or Spreader Machine (asphalt), (Barber Greene and similar) (Screedman required); Mine or Shaft Hoist; Mobile Concrete Mixer (over 5 tons); Pipe Bending Machine (pipelines only);

Pipe Cleaning Machine (tractor propelled and supported); Pipe Wrapping Machine (tractor propelled and supported); Roller Operator (Asphalt); Self-Propelled Elevating Grade Plane; Slusher Operator; Tractor (with boom) (D-6, or similar); Trencher (over 6 feet and less than 200 h.p.); Water Tanker (pulled by Euclids, T-Pulls, DW-10, 20 or 21, or similar); Winchman (Stern Winch on Dredge).

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

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

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

GROUP 10: Chicago Boom; Cold Planers; Heavy Duty Repairman or Welder; Hoist and/or Winch (3 drums); Hydraulic Skooper (Koehring and similar); Loader (over 6 cu. yds. up to and including 12 cu. yds.); Saurman type Dragline (over 5 cu. yds.); Self-propelled, rubber-tired Earthmoving Equipment (over 20 cu. yds. up to and including 31 cu. yds.) (637D and similar); Soil Stabilizer (P & H or equal); Sub-Grader (Gurries or other automatic type); Tractors (D-9 or equivalent, all attachments); Tractor (Tandem Scraper); Watch Engineer.

GROUP 10A: Boat Operator; Cable-operated Crawler Crane (up to and including 25 tons); Cable-operated Power Shovel, Clamshell, Dragline and Backhoe (up to and including 1 cu.

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

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

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

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

dismantling, and moving of equipment there shall be an additional Operating Engineer or Heavy Duty Repairman); Yo-Yo Cat or Dozer.

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

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

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

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

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

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

BOOMS AND/OR LEADS (HOURLY PREMIUMS):

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

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

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

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

	Rates	Fringes
Dredging: (Boat Operators)		
Boat Deckhand	$ 41.22	30.93
Boat Operator	$ 43.43	30.93
Master Boat Operator	$ 43.58	30.93
Dredging: (Clamshell or Dipper Dredging)		
GROUP 1	$ 43.94	30.93
GROUP 2	$ 43.28	30.93
GROUP 3	$ 42.88	30.93
GROUP 4	$ 41.22	30.93
Dredging: (Derricks)		
GROUP 1	$ 43.94	30.93
GROUP 2	$ 43.28	30.93
GROUP 3	$ 42.88	30.93
GROUP 4	$ 41.22	30.93
Dredging: (Hydraulic Suction Dredges)		
GROUP 1	$ 43.58	30.93
GROUP 2	$ 43.43	30.93
GROUP 3	$ 43.28	30.93
GROUP 4	$ 43.22	30.93
GROUP 5	$ 37.88	26.76
Group 5	$ 42.88	30.93
GROUP 6	$ 37.77	26.76
Group 6	$ 42.77	30.93
GROUP 7	$ 36.22	26.76
Group 7	$ 41.22	30.93

CLAMSHELL OR DIPPER DREDGING CLASSIFICATIONS

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

HYDRAULIC SUCTION DREDGING CLASSIFICATIONS

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

DERRICK CLASSIFICATIONS

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

ENGI0003-044 09/03/2018

	Rates	Fringes
Power Equipment Operators (PAVING)		
Asphalt Concrete Material Transfer	$ 42.92	32.08
Asphalt Plant Operator	$ 43.35	32.08
Asphalt Raker	$ 41.96	32.08
Asphalt Spreader Operator	$ 43.44	32.08
Cold Planer	$ 43.75	32.08
Combination Loader/Backhoe (over 3/4 cu.yd.)	$ 41.96	32.08
Combination Loader/Backhoe (up to 3/4 cu.yd.)	$ 40.98	32.08
Concrete Saws and/or Grinder (self-propelled unit on streets, highways, airports and canals)	$ 42.92	32.08
Grader	$ 43.75	32.08
Laborer, Hand Roller	$ 41.46	32.08
Loader (2 1/2 cu. yds. and under)	$ 42.92	32.08
Loader (over 2 1/2 cu. yds. to and including 5 cu. yds.)	$ 43.24	32.08
Roller Operator (five tons and under)	$ 41.69	32.08
Roller Operator (over five tons)	$ 43.12	32.08
Screed Person	$ 42.92	32.08
Soil Stabilizer	$ 43.75	32.08

IRON0625-001 09/01/2021

	Rates	Fringes
Ironworkers:	$ 43.50	36.84

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

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* LABO0368-001 09/05/2022

	Rates	Fringes
Laborers:		
Driller	$ 41.00	24.25
Final Clean Up	$ 30.45	19.57
Gunite/Shotcrete Operator and High Scaler	$ 40.50	24.25
Laborer I	$ 40.00	24.25
Laborer II	$ 37.40	24.25
Mason Tender/Hod Carrier	$ 40.50	24.25
Powderman	$ 41.00	24.25
Window Washer (bosun chair)	$ 39.50	24.25

LABORERS CLASSIFICATIONS

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

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

materials (6-inch) pipe and over); Piping: resurfacing and paving of all ditches in preparation for laying of all pipes; Pipe laying of lateral sewer pipe from main or side sewer to buildings or structure (except Contactor may direct work be done under proper supervision); Pipe laying, leveling and marking of the joint used for main or side sewers and storm sewers; Laying of all clay, terra cotta, ironstone, vitrified concrete, HDPE or other pipe for drainage; Placing and setting of water mains, gas mains and all pipe including removal of skids; Plaster Mortar Mixer/Pump; Pneumatic Impact Wrench; Portable Sawmill Operation: Choker setters, off bearers, and lumber handlers connected with clearing; Posthole Digger (Hand Held, Gas, Air and Electric); Powderman's Tender; Power Broom Sweepers (Small); Preparation and Compaction of roadbeds for railroad track laying, highway construction, and the preparation of trenches, footings, etc., for cross-country transmission by pipelines, electrical transmission or underground lines or cables (by mechanical means); Raising of structure by manual or hydraulic jacks or other methods and resetting of structure in new locations, including all concrete work; Ramming or compaction; Rigging in connection with Laborers' work (except demolition), Signaling (including the use of walkie talkie) Choke Setting, tag line usage; Tagging and Signaling of building materials into high rise units; Riprap, Stonepaver, and Rock Slinger (includes placement of stacked concrete, wet or dry and loading, unloading, signaling, slinging and setting of other similar materials); Rotary Scarifier (including multiple head concrete chipping Scarifier); Salamander Heater, Drying of plaster, concrete mortar or other aggregate; Scaffold Erector Leadman; Scaffolds: (Swing and hanging) including maintenance thereof; Scaler; Septic Tank/Cesspool and Drain Fields Digger and Installer; Shredder/Chipper (tree branches, brush, etc.); Stripping and Setting Forms; Stripping of Forms: Other than panel forms which are to be re-used in their original form, and stripping of forms on all flat arch work; Tampers (Barko, Wacker, and similar type); Tank Scaler and Cleaners; Tarman; Tree Climbers and Trimmers; Trencher (includes hand-held, Davis T-66 and similar type); Trucks (flatbed up to and including 2 1/2 tons when used in connection with on-site Laborers'work; Trucks (Refuse and Garbage Disposal) (from job site to dump); Vibra-Screed (Bull Float in connection with Laborers' work); Well Points, Installation of or any other dewatering system.

Laborer II: Asphalt Plant Laborer; Boring Machine Tender; Bridge Laborer; Burning of all debris (crates, boxes, packaging waste materials); Chainman, Rodmen, and Grade Markers; Cleaning, clearing, grading and/or removal for

streets, highways, roadways, aprons, runways, sidewalks, parking areas, airports, approaches, and other similar installations; Cleaning or reconditioning of streets, ways, sewers and waterlines, all maintenance work and work of an unskilled and semi-skilled nature; Concrete Bucket Tender (Groundman) hooking and unhooking of bucket; Concrete Forms; moving, cleaning, oiling and carrying to the next point of erection of all forms; Concrete Products Plant Laborers; Conveyor Tender (conveying of building materials); Crushed Stone Yards and Gravel and Sand Pit Laborers and all other similar plants; Demolition, Wrecking and Salvage Laborers: Wrecking and dismantling of buildings and all structures, with use of cutting or wrecking tools, breaking away, cleaning and removal of all fixtures, All hooking, unhooking, signaling of materials for salvage or scrap removed by crane or derrick; Digging under streets, roadways, aprons or other paved surfaces; Driller's Tender; Chuck Tender, Outside Nipper; Dry-packing of concrete (plugging and filling of she-bolt holes); Fence and/or Guardrail Erector: Dismantling and/or re-installation of all fence; Finegrader; Firewatcher; Flagman (Coning, preparing, stablishing and removing portable roadway barricade devices); Signal Men on all construction work defined herein, including Traffic Control Signal Men at construction site; General Excavation; Backfilling, Grading and all other labor connected therewith; Digging of trenches, ditches and manholes and the leveling, grading and other preparation prior to laying pipe or conduit for any purpose; Excavations and foundations for buildings, piers, foundations and holes, and all other construction. Preparation of street ways and bridges; General Laborer: Cleaning and Clearing of all debris and surplus material. Clean-up of right-of-way. Clearing and slashing of brush or trees by hand or mechanical cutting. General Clean up: sweeping, cleaning, wash-down, wiping of construction facility and equipment (other than ""Light Clean up (Janitorial) Laborer. Garbage and Debris Handlers and Cleaners. Appliance Handling (job site) (after delivery unlading in storage area); Ground and Soil Treatment Work (Pest Control); Gunite/Shotcrete Operator Tender; Junk Yard Laborers (same as Salvage Yard); Laser Beam ""Target Man"" in connection with Laborers' work; Layout Person for Plastic (when work involves waterproofing for waterponds, artificial lakes and reservoirs); Limbers, Brush Loaders, and Pilers; Loading, Unloading, carrying, distributing and handling of all rods and material for use in reinforcing concrete construction (except when a derrick or outrigger operated by other than hand power is used); Loading, unloading, sorting, stockpiling, handling and distribution of water mains, gas mains and all pipes; Loading and unloading of all materials, fixtures, furnishings and

appliances from point of delivery to stockpile to point of installation; hooking and signaling from truck, conveyance or stockpile; Material Yard Laborers; Pipelayer Tender; Pipewrapper, Caulker, Bander, Kettlemen, and men applying asphalt, Laykold, Creosote, and similar-type materials (pipe under 6 inches); Plasterer Laborer; Preparation, construction and maintenance of roadbeds and sub-grade for all paving, including excavation, dumping, and spreading of sub-grade material; Prestressed or precast concrete slabs, walls, or sections: all loading, unloading, stockpiling, hooking on of such slabs, walls or sections; Quarry Laborers; Railroad, Streetcar, and Rail Transit Maintenance and Repair; Roustabout; Rubbish Trucks in connection with Building Construction Projects (excluding clearing, grubbing, and excavating); Salvage Yard: All work connected with cutting, cleaning, storing, stockpiling or handling of materials, all cleanup, removal of debris, burning, back-filling and landscaping of the site; Sandblasting Tender (Pot Tender): Hoses and pots or markers; Scaffolds: Erection, planking and removal of all scaffolds used for support for lathers, plasters, brick layers, masons, and other construction trades crafts; Scaffolds: (Specially designed by carpenters) laborers shall tend said carpenter on erection and dismantling thereof, preparation for foundation or mudsills, maintenance; Scraping of floors; Screeds: Handling of all screeds to be reused; handling, dismantling and conveyance of screeds; Setting, leveling and securing or bracing of metal or other road forms and expansion joints; Sheeting Piling/trench shoring (handling and placing of skip sheet or wood plank trench shoring); Ship Scalers; Shipwright Tender; Sign Erector (subdivision traffic, regulatory, and street-name signs); Sloper; Slurry Seal Crews (Mixer Operator, Applicator, Squeegee Man, Shuttle Man, Top Man); Snapping of wall ties and removal of tie rods; Soil Test operations of semi and unskilled labor such as filling sand bags; Striper (Asphalt, Concrete or other Paved Surfaces); Tool Room Attendant (Job Site); Traffic Delineating Device Applicator; Underpinning, lagging, bracing, propping and shoring, loading, signaling, right-of-way clearance along the route of movement, The clearance of new site, excavation of foundation when moving a house or structure from old site to new site; Utilities employees; Water Man; Waterscape/Hardscape Laborers; Wire Mesh Pulling (all concrete pouring operations); Wrecking, stripping, dismantling and handling concrete forms an false work.

LABO0368-002 09/05/2022

	Rates	Fringes

Landscape & Irrigation
Laborers

GROUP 1.....	$ 27.25	15.80
GROUP 2.....	$ 28.25	15.80
GROUP 3.....	$ 22.15	15.80

LABORERS CLASSIFICATIONS

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

horticultural work relating to said planting; Operation of flat bed trucks (up to and including 2 1/2 tons).:

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

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

and fittings shall be paid for at the rate of pay specified under Landscape & Irrigation Laborer(Group 1); Watering by hand or sprinkler system and the peformance of other types of gardening, yardman, and horticultural-related work.

LABO0368-003 09/05/2022

	Rates	Fringes
Underground Laborer		
GROUP 1	$ 40.60	24.25
GROUP 2	$ 42.10	24.25
GROUP 3	$ 42.60	24.25
GROUP 4	$ 43.60	24.25
GROUP 5	$ 43.95	24.25
GROUP 6	$ 44.20	24.25
GROUP 7	$ 44.65	24.25

GROUP 1: Watchmen; Change House Attendant.

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

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

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

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

GROUP 6: Shifter

GROUP 7: Shifter (Shaft Work & Raiser)

PAIN1791-001 07/01/2022

	Rates	Fringes

Painters:
Brush.....$ 40.00 30.59
Sandblaster; Spray.....$ 40.00 30.59

PAIN1889-001 07/01/2022

	Rates	Fringes
Glaziers.....	$ 41.50	38.37

PAIN1926-001 02/27/2022

	Rates	Fringes
Soft Floor Layers.....	$ 38.77	33.31

PAIN1944-001 01/02/2022

	Rates	Fringes
Taper.....	$ 43.85	32.65

PLAS0630-001 09/05/2022

	Rates	Fringes
PLASTERER.....	$ 45.00	33.58

PLAS0630-002 08/31/2020

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

PLUM0675-001 07/03/2022

	Rates	Fringes
Plumber, Pipefitter, Steamfitter & Sprinkler Fitter...	$ 50.13	29.05

ROOF0221-001 09/05/2021

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

SHEE0293-001 02/27/2022

	Rates	Fringes
Sheet metal worker	$ 46.22	30.64

* SUHI1997-002 09/15/1997

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

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

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** Workers in this classification may be entitled to a higher minimum wage under Executive Order 14026 ($15.00) or 13658 ($11.25). Please see the Note at the top of the wage determination for more information.

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

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

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

Union Rate Identifiers

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

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

Survey Rate Identifiers

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

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

Union Average Rate Identifiers

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

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

WAGE DETERMINATION APPEALS PROCESS

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

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

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

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

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

2.) If the answer to the question in 1.) is yes, then an

interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

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

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

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

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

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

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END OF GENERAL DECISIO"

PROPOSAL TO THE

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

PROJECT: KAMEHAMEHA HIGHWAY INTERSECTION IMPROVEMENTS
AT KAHEKILI HIGHWAY
DISTRICT OF KOOLAUPOKO
ISLAND OF OAHU

PROJECT NO.: NH-083-1(082)

COMPLETION TIME: 365 Working days from the date indicated in the Notice to Proceed from the Department

DBE PROJECT GOAL: 8.7%

DESIGN PROJECT MANAGER:

NAME Andrew Hirano
ADDRESS 601 Kamokila Boulevard, Room 688
Kapolei, Hawaii 96707
PHONE NO. (808) 692-7546
FAX NO. (808) 692-7555

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
201.1000	Clearing and Grubbing	7500	S.Y.	$_____	$_____
202.0100	Removal of Existing Traffic Sign(s) and Post(s)	20	Each	$_____	$_____
202.0200	Removal of Existing Concrete Piles	8	Each	$_____	$_____
202.0300	Removal of Existing Headwall	1	Each	$_____	$_____
202.0400	Removal of Existing Drain Inlet	1	Each	$_____	$_____
202.0500	Removal of Existing Drain Manhole	1	Each	$_____	$_____
202.0600	Removal of Existing Pavement	800	S.Y.	$_____	$_____
202.0700	Removal of Existing Waterline	2	Each	$_____	$_____
203.1000	Roadway Excavation	5300	C.Y.	$_____	$_____
204.1000	Trench Excavation for Water System	105	C.Y.	$_____	$_____
204.2000	Trench Backfill for Water System	L.S.	L.S.	L.S.	$_____
206.1000	Excavation for Drainage System	350	C.Y.	$ _____	$_____
208.1000	Leveling Surfaces	F.A.	F.A.	F.A.	$ 10,000
209.0100	Installation, Maintenance, Monitoring, and Removal of BMP	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
209.0200	Additional Water Pollution, Dust, and Erosion Control	F.A.	F.A.	F.A.	$ 50,000
219.1000	Determination and Characterization of Fill Material	L.S.	L.S.	L.S.	$_____
301.1000	Hot Mix Asphalt Base Course	1200	Ton	$_____	$_____
304.1000	Aggregate Base	3400	C.Y.	$_____	$_____
313.1000	Permeable Separator	4400	S.Y.	$_____	$_____
401.1000	PMA Pavement, Mix No. IV. (PG 64E-22)	750	Ton	$_____	$_____
411.1000	Truck Apron, 11-inch Concrete Pavement	150	C.Y.	$_____	$_____
411.2000	Bus Bay Pad, 11-inch Concrete Pavement	85	C.Y.	$_____	$_____
415.1000	Cold Planing	650	S.Y.	$_____	$_____
417.1000	Geogrid	4400	S.Y.	$_____	$_____
503.1000	Concrete in Water Systems	16	C.Y.	$_____	$_____
513.1000	CMU Wall	153	L.F.	$_____	$_____
602.1000	Reinforcing Steel for Water System	1660	Pound	$_____	$_____
603.0400	Clean Existing Culverts	F.A.	F.A.	F.A.	$ 20,000

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
603.1000	24-Inch Reinforced Concrete Pipe, Class III	283	LF	$_____	$_____
603.5000	Bed Course Material for Culvert	90	C.Y.	$_____	$_____
604.3100	Type A Catch Basin, 4 feet to 5 feet	1	Each	$_____	$_____
604.3200	Type B1 Catch Basin, 4 feet to 5 feet	1	Each	$_____	$_____
604.3300	Type C1 Catch Basin, 4 feet to 5 feet	2	Each	$_____	$_____
604.3400	Type 61614P Grated Drop Inlet, 4 feet to 5 feet	2	Each	$_____	$_____
604.4100	Adjusting Drain Manhole Cast Iron Frame and Cover	1	Each	$_____	$_____
604.6500	Type A Storm Drain Manhole, 4 feet to 5 feet	2	Each	$_____	$_____
606.1000	Guardrail Type 31” W-Beam with Standard 8” Offset Block	230	LF	$_____	$_____
606.3200	Guardrail W-Beam End Section, Rounded	3	Each	$_____	$_____
614.1000	Reconstructing Street Survey Monument	1	Each	$_____	$_____
622.1000	Roadway Lighting System	L.S.	L.S.	L.S.	$_____
624.1000	Water System A	L.S.	L.S.	L.S.	$_____
624.2000	Water System B	L.S.	L.S.	L.S.	$_____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
624.3000	Type X-Meter Box	1	Each	$_____	$_____
626.1000	Adjusting Sewer Manhole Frame and Cover	6	Each	$_____	$_____
626.1100	Adjusting Water Manhole, Frame, and Cover	4	Each	$_____	$_____
626.1200	Adjusting (Water) Standard Valve Box	3	Each	$_____	$_____
627.1000	Cathodic Protection System	L.S.	L.S.	L.S.	$_____
629.1100	White, 6-inch Pavement Striping (Type I, Tape, or Thermoplastic)	1700	L.F.	$_____	$_____
629.1110	Yellow, 4-inch Pavement Striping (Type I, Tape, or Thermoplastic)	1700	L.F.	$_____	$_____
629.1120	White, 4-Inch Pavement Striping (Type I, Tape, or Thermoplastic)	360	LF	$_____	$_____
629.3100	Yellow, 12-Inch Pavement Striping (Type I, Tape, or Thermoplastic)	30	LF	$_____	$_____
629.3200	White, 12-Inch Pavement Striping (Tape, Type III, or Thermoplastic)	120	L.F.	$_____	$_____
629.4100	Yellow, Double 4-Inch Pavement Striping (Tape, Type I, or Thermoplastic)	620	L.F.	$_____	$_____
629.5100	Crosswalk Marking (Tape, Type III, or Thermoplastic)	6	Lane	$_____	$_____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
629.5200	Pavement Arrow (Tape, Type III, or Thermoplastic)	6	Each	$_____	$_____
629.5300	Pavement Symbol (Tape, Type III, or Thermoplastic)	6	Each	$_____	$_____
629.6100	Type J Pavement Marker	10	Each	$_____	$_____
629.6200	Type C Pavement Marker	40	Each	$_____	$_____
629.6300	Type D Pavement Marker	24	Each	$_____	$_____
629.6400	Type H Pavement Marker	100	Each	$_____	$_____
629.6500	Type F Pavement Marker	4	Each	$_____	$_____
630.2000	Panel for Destination Sign	72	S.F.	$_____	$_____
630.2200	Flanged Channel Post for Destination Sign	18	Each	$_____	$_____
631.1100	Regulatory Sign (10 Square Feet or Less)	3	Each	$_____	$_____
631.1200	Regulatory Sign (10 Square Feet or Less) with Post	9	Each	$_____	$_____
631.3110	Warning Sign (10 Square Feet or Less)	6	Each	$_____	$_____
631.3120	Warning Sign (10 Square Feet or Less) with Post	9	Each	$_____	$_____
631.2000	Relocation of Existing Sign	3	Each	$_____	$_____

PROPOSAL SCHEDULE					
ITEM NO.	**ITEM**	**APPROX. QUANTITY**	**UNIT**	**UNIT PRICE**	**AMOUNT**
632.2000	Type II Object Marker	70	Each	$_____	$_____
634.1000	Portland Cement Concrete Sidewalk	1000	S.Y.	$_____	$_____
638.1000	Curb, Type 2D	1100	L.F.	$_____	$_____
638.2000	Curb, Type 2A Modified	310	L.F.	$_____	$_____
638.3000	Curb and Gutter, Type DG	1000	L.F.	$_____	$_____
638.4000	Gutter, Type 1211214	31	L.F.	$_____	$_____
641.1000	Hydro-Mulch Seeding	3100	S.Y.	$_____	$_____
643.0100	Maintenance of Existing Landscape Areas	F.A.	F.A.	F.A.	$ 50,000
645.1000	Traffic Control (365 Days)	L.S.	L.S.	L.S.	$_____
645.2000	Additional Police Officers, Additional Traffic Control Devices, and Advertisement	F.A.	F.A.	F.A.	$ 100,000
648.1000	Field Posted Drawings	L.S.	L.S.	L.S.	$_____
650.1300	Curb Ramp, Type C	3	Each	$_____	$_____
650.1400	Curb Ramp, Type D	2	Each	$_____	$_____
650.1500	Curb Ramp, Type Combination	12	Each	$_____	$_____

PROPOSAL SCHEDULE

ITEM NO.	ITEM	APPROX. QUANTITY	UNIT	UNIT PRICE	AMOUNT
671.1000	Protection of Endangered Species	F.A.	F.A.	F.A.	$ 25,000
675.1000	Type C Bus Shelter	2	Each	$_____	$_____
675.2000	Removal of Existing Bus Shelter	L.S.	L.S.	L.S.	$_____
695.1000	Public Education Materials or Services	F.A.	F.A.	F.A	$ 20,000
696.0500	Maintenance of Trailers	F.A.	F.A.	F.A.	$ 50,000
697.1000	Qualified Arborist, Root Barrier Installation and Tree and Root Pruning	F.A.	F.A.	F.A.	$ 50,000
699.1000	Mobilization (Not to Exceed 6 Percent of the Sum of All Items Excluding Bid Price of this Item)	L.S.	L.S.	L.S.	$_____

Sum of All Items ..... $ _____

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

PROPOSAL SCHEDULE

The bidder is directed to Subsection 105.16 – Subcontracts.

The bidder's attention is directed to Sections 696 - Field Office and Project Site Laboratory and 699 - Mobilization for the limitation of the amount bidders are allowed to bid.

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

The bidder is directed to Section 717 – Cullet and Cullet-Made Materials regarding recycling of waste glass.

PRE-BID MEETING MINUTES

Kamehameha Highway, Intersection Improvements
at Kahekili Highway
Federal-Aid Project No. NH-083-1(082)
Island of Oahu

Date/Time: September 28, 2022; 10:00 a.m.

Location: Teams Virtual Meeting

Attendees: Andrew Hirano (HWY-DS, Project Manager & HIePRO buyer)
Henry Kennedy (HWY-D, Acting Engineering Program Manager)
Holly Yuen (HWY-DS, Acting Section Head)
Matthew Morita (HWY-OR, Oahu District Resident Engineer)
Danny Yee (HWY-OR, Oahu District Engineer)
Daniel Williams (Office of Civil Rights)
Gerald Andrade (WSP USA Inc.)
Joseph Salvador (WSP USA Inc.)
Cole Millare (Grace Pacific LLC)

Discussion items:

1. Andrew Hirano, introduced himself as the project manager and HIePRO buyer for the project. Individuals on the call introduced themselves.

2. The project is located at the intersection of Kamehameha Highway and Kahekili Highway; which is near the Kahaluu Hygienic Store. This project will convert the existing T-intersection into a roundabout configuration. The work will occur within the current Department of Transportation Right-of-Way.

3. Meeting minutes and attendance will be included as part of a solicitation addendum.

4. Some items to be aware of:
    a. The construction contract was solicited on September 14, 2022.
    b. The construction proposals are due by October 20, 2022, at 2:00pm.
    c. Attendance for this pre-bid conference is optional.
    d. Any questions will not be addressed during this pre-bid meeting. All questions must be submitted in writing, and submitted in the HIePRO system by October 6, 2022, at 2:00pm.
    e. Answers to the questions will be published by October 13, 2022, at 4:00pm.
    f. This project has a Disadvantaged Business Enterprise requirement which will require the contractor to submit certifications by October 25, five days after bid opening. Daniel Williams, from the Office of Civil Rights, will be addressing this.
    g. The Contractor should account for limited available work area within the intersection during each phase of construction.
    h. Access to the adjacent businesses shall be maintained throughout the construction.
    i. The Contractor shall coordinate with the Kahekili Highway resurfacing project.
    j. Normal working hours is 7:00am to 3:30pm, Monday through Friday, excluding holidays. If there is any need for night work, the Contractor shall justify and request such to the District

Engineer and shall be responsible for obtaining a noise variance for the night time work. Night time work shall be avoided during the Hawaii seabird fledgling period from September 15 through December 15. However, if night time work does occur, lights shall be shielded and directed toward the ground.

k. A National Pollutant Discharge Elimination System (NPDES) permit has been obtained for this project, filing number is HIR10G961.

5. Disadvantaged Business Enterprise (DBE) requirements were reviewed by Daniel Williams of the Office of Civil Rights:

Policy of the State of Hawaii, Department of Transportation's (HDOT) DBE Program:

To ensure equal opportunity and non-discrimination in the award and administration of United States DOT-assisted contracts. Contractors shall take all necessary and reasonable steps in accordance with the regulations (49 CFR, Part 26) to ensure that DBE's have an equal opportunity to compete for and perform on contracts.

DBE Goal for this project: **8.7%**

- Be sure to document discussions, phone calls, faxes or memos relating to your efforts in meeting the DBE goal.
- DBEs must be certified by the bid opening date.
- DBE subcontractors, manufacturers, suppliers, trucking companies and any second tier subcontractors shall be listed on the respective DBE forms in order to receive credit.

The following forms are due by the close of business (i.e. 4:30 pm HST) five (5) days after bid opening:

a. **DBE Confirmation and Commitment Agreement**. This form must be **signed by the bidder/offeror and each DBE** subcontractor, manufacturer, supplier, or trucking company and submitted to the Project Manager. Information to be provided on the form shall include, among other things, the project number, the DBE's NAICS codes, description of work, bid items with corresponding price information, prime contractor name and contact information DBE name and contact information and subcontractor name and contact information if the DBE is a second tier subcontractor.

To count toward meeting a goal, each DBE firm must be certified in a NAICS code applicable to the kind of work the firm would perform on the contract.

b. **DBE Contract Goal Verification and Good Faith Efforts (GFE) Documentation for Construction**. List the dollar amount of all subcontractors, manufacturers, suppliers, and trucking companies (both DBE and non-DBE firms). Bidder/offeror must also list the DBE project goal on this form. The bidder/offeror must submit documentation demonstrating how the DBE goal was met or how the bidder/offeror attempted to meet the goal if the goal was not met. This documentation shall include quotations for both DBE and non-DBE subcontractors when a non-DBE is selected over a DBE for the project.

Documentation of good faith efforts is required irrespective of whether the bidder/offeror met the DBE project goal.

The above forms must be complete and provide the necessary information to properly evaluate bids/proposals. Failure to provide any of the above shall be cause for bid/proposal rejection.

In determining calendar days, the day from which the period begins to run is not counted, and when the last day of the period is a Saturday, Sunday, or Federal or State holiday, the period extends to the next day that is not a Saturday, Sunday, or holiday.

- Calculation of the DBE contract goal for this project is the proportionate contract dollar value of work performed, materials, and goods to be supplied by DBEs. DBE credit shall not be given for mobilization, force account items and allowance items. This DBE contract goal is applicable to all the contract work performed for this project.

  DBE contract goal percentage = Contract Dollar Value of the work to be performed by DBE subcontractors and manufacturers, plus 60% of the contract dollar value of DBE suppliers, divided by the sum of all contract items (sum of all contract items is the total amount for comparison of bids less mobilization, force account items, and allowance items).

  The Department shall adjust the bidder's/offeror's DBE contract goal to the amount of the project goal if it finds that the bidder/offeror met the goal but erroneously calculated a lower percentage. If the amount the bidder/offeror submits as its contract goal exceeds the project goal, the bidder/offeror shall be held to the higher goal.

- In the bid documents, be sure to refer to DBE Requirements section and pay special attention to Section VIII. Demonstration of Good Faith Efforts for Contract Award, which summarizes the kinds of efforts that will be considered demonstrative of good faith efforts.
- All federally funded projects awarded after October 1, 2017 are required to use the Certification and Contract Compliance Management System program, an online payment tracking system. This project will be required to use the Certification and Contract Compliance Management System program. HDOT OCR will work with the Project Engineer and selected bidder to get the contract information to create a contract record for the project. Subcontractors, suppliers, manufacturers, trucking companies, etc. that are selected to work on this project are expected to log in (on a regular basis) and indicate if payment was prompt and provide all required information.
- BIDDER REGISTRATION FORM. All firms bidding or quoting on DOT projects, including vendors, subcontractors, manufacturers, truckers, etc., must register as a bidder. Certified DBEs are automatically registered as a bidder with the HDOT.
  Bidder Registration Form can be found at:
  https://hidot.hawaii.gov/administration/files/2019/03/Bidder-Registration-Fillable-Form.pdf

- Be sure to check the DBE Directory online at: https://hdot.dbesystem.com/ to ensure the DBEs listed are certified.

Meeting was adjourned at 10:20am.

RESPONSE TO REQUEST FOR INFORMATION (RFI'S / QUESTIONS)

KAMEHAMEHA HIGHWAY INTERSECTION IMPROVEMENTS
AT KAHEKILI HIGHWAY
ISLAND OF OAHU

FEDERAL-AID PROJECT NO. NH-083-1(082)

1. Question: How will Cold Planing of existing pavement from Station 231+67 to Station 232+92.5 be paid for? Is it paid per SY under 202.0600 Removal of Existing Pavement?

   Response: Added pay item for cold planing.

2. Question: For Pay Item 630.2000 Panel for Destination Sign with signs called out on sheets 56, 57, & 58, can you please clarify if these signs are flat sheet or extruded aluminum?

   Response: Per Section 750.01(B) - Backing, sign backing material can be either Sheet Aluminum, Extruded Aluminum Panels or Luminated Panels.

3. Question: 630.2200 Flanged Channel Post for Destination sign, can you please confirm that these posts are 4 pound flanged channel posts (if not can you please provide details)?

   Response: For destination signs D1 thru D-5 standard plan TE-02 shall apply, utilizing 2.5-lb flanged channel installation with 3 posts.

4. Question: 630.2200 Flanged Channel Post for Destination Sign, can you please consider changing pay unit from 229 LF to 18 each? There have been issues on how to measure the posts in the past.

   Response: 630.2200 Flanged Channel Post for Destination Sign, changed pay unit to each.

5. Question: 632.2000 Type II Object Marker, can you please clarify where these are to be mounted? In the past they have been mounted on sign posts, trees, and utility poles. There is a legend on sheet 55, but does not seem to be called out on sheets 56, 57 & 58.

   Response: To be addressed in addendum 2.

6. Question: Are Post mounted Advisory Boards (Notice to Motorist) Required Per Spec 645.03(G) Advisory Signs. Submit advisory sign shop drawings. Construct, install, maintain, and remove two advisory signs as ordered by the Engineer. Place signs at locations designated by the Engineer. Provide signs, minimum B feet wide by 4 feet high, with black letters on orange background, and with three 4,00 pounds/foot flanged channel posts for each sign? If so, can you please provide locations?

   Response: To be addressed in addendum 2.

7. Question: Can you please confirm that Construction Work Zone Signs on Sheet 60 are needed on the three Hwy. Locations (Kamehameha Hwy - Kahuku, Kamehameha Hwy - Heeia, and Kahekili Hwy)?

   Response: Yes, Construction Work Zone Signs shall be installed on all three approaches to the intersection.

8. Question: Can used signs, posts and hardware be used for Advisory and Construction Work Zone Signs if they are required for the project?

   Response: Sheet 60 (Note 9)- Construction Work Zone speed limit signs shall be new and become the property of the Contractor.

9. Question: Can you please clarify the difference between Pay Item 631.2000 Relocation of Existing signs and Incidental Relocation of signs on sheet 55 Note #9?

   Response: Pay item 631.2000 covers those existing signs to be relocated due to foreseen conflicts with proposed construction to the greatest extent practicable based upon available information. Incidental Relocation of signs described in Note 9 on Sheet 55 is intended to cover unforeseen conditions. No adjustments will be made to pay item 631.2000.

10. Question: For note 9 on sheet 55 incidental relocation of signs, can this be included in pay item 631.2000 relocation of Existing Signs - as sign locations may need to be adjusted to exact location of the sidewalk and underground utilities and other obstructions?

    Response: Pay item 631.2000 covers those existing signs to be relocated due to foreseen conflicts with proposed construction to the greatest extent practicable based upon available information. Incidental Relocation of signs described in Note 9 on Sheet 55 is intended to cover unforeseen conditions. No adjustments will be made to pay item 631.2000.

11. Question: Pay item 645.1000 Traffic Control (270 days) - can you please clarify this as the project is 544 calender days?

Response: Traffic Control Lump Sum shall cover the duration of the project. Note, contract duration modified to 365 working days.

12. Question: On sheet 60 it says the signs are to be paid under 645.1000 but the Pay Item 645.1000 Traffic Control says (270 Days)- can you please clarify this?

Response: Temporary Traffic Control related signage and the removal and restoration of existing regulatory speed limit signs shall be considered incidental to 645.1000 - Traffic Control.

13. Question: For pay item 606.3200 Guardrail Terminal Connector Type W-Beam End Section - can you please clarify this end section and provide a detail?

Response: Revised pay item for clarity. W-Beam End Section (Rounded RWE03) detail can be found on sheet 33 in the planset.

14. Question: For pay item 606.3200 Guardrail Terminal Connector Type W-Beam End Section - the drawings see to call out W-Beam End Section (Rounded RWE03a) - Can you please confirm this? As there was a major accident with bad consequences with this end section at the end of the guardrail run.

Response: Confirmed, pay item revised for clarity.

15. Question: On sheet 26 Note 1 it calls out for CRT posts - can you please provide a detail with material and installation for this location at STA 238+50?

Response: To be addressed in addendum 2.

16. Question: Can you please clarify, on previous DOT Hwy projects when deleting 2 post a MGS Long Span LSC-2 has been used, but that system calls out for 3 CRT Wood Posts on each side of the catch basin, but with the site on this project, it does not seem to have length of need on the roundabout side of the Guardrail Run at STA 238+50 after the 3 CRT Posts?

Response: To be addressed in addendum 2.

17. Question: Can you please clarify if the transition on sheet 34 from MGS GR to Strong Post GR will be paid for under 606.1000 Guardrail Type 31" W-Beam with Standard 8" Offset Block?

Response: Yes, transition on sheet 34 from MGS GR to Strong Post GR will be paid for under 606.1000 Guardrail Type 31" W-Beam with Standard 8" Block.

18. Question: What are the work hours? Is it typical 7am to 3:30 pm?

Response: Refer to spec 107.03 and 645.03(F).

19. Question: General Note 18 on Plan Sheet 3 mentions night work;is night work allowed? Has the State obtained a noise variance?

Response: No night work is anticipated for this project.

20. Question: Will the state be managing this project or will it be a consultant? Who will be the consultant?

Response: The State will be managing this project with consulting support services.

21. Question: Are there any known hazardous materials to be removed/disturbed? Will contractor be compensated if hazardous materials are found?

Response: Although the project is adjacent to an existing gas station, no hazardous materials are anticipated. Any hazardous materials encountered shall be treated as an unforeseen condition.

22. Question: Proposal Item 696.0500 is for Maintenance of Trailers. Are trailers to be provided on this project? If so, what item will they be paid under?

Response: No trailers to be provided at the project site. Maintenance of Trailers force account item to be used to maintain trailers at the nearby HDOT Kaneohe field office location which will support the project.

23. Question: Water Note 22 on Plan sheet 9 states that the Contractor shall hire a State of Hawaii DOH certified lab to provide water sampling services. Requesting a list of certified labs be provided.

Response: A full list of approved DOH laboratories can be found on the DOH website (see Certified/Approved Drinking Water Laboratories in the navigtation pane on the right hand side of the website):
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24. Question: Geotechnical Notes on Plan Sheet 98 states that a geotechnical engineering report has been prepared. Requesting copy of the report be provided on HIePRO.

Response: Geotechnical Engineering Exploration Report provided.

25. Question: Geotechnical Notes on Plan Sheet 85 states that a Foundation Report has been prepared. Requesting copy of the Foundation Report be provided on HIePRO

Response: Foundations are covered in the provided Geotechnical Engineering Exploration Report.

26. Question: General Note 1 on Plan Sheet 59 states that the traffic control plans provided are for major construction activities. Can a list of the major construction activities be provided? Also, can you please provide the major construction activities that are covered under each traffic control plan phase?

Response: Traffic Control Plans included in the bidset are intended to provide access to work zones in order to construct the intersection in phases without presupposing contractor's means and methods. Contractor shall evaluate the work proposed and plan accordingly. The cost for all traffic control shall be included in pay item 645.1000.

27. Question: There are a three Water Manholes that are called out to be adjusted. What item will these be paid under?

Response: Added pay item 626.1100.

28. Question: Section 411 of the Special Provisions mentions the use of a slip form paver. Is the use of a slip form paver required? Quantities are small and space is limited in this area.

Response: Use of slip form paver is not required.

29. Question: Concerning curb ramps, what proposal items are "Combination" ramps (11 EA) and "Bike" Ramps (1 EA) paid under? Currently there are only items "650.1300 Curb Ramp Type C (3 EA) and "650.1400 Curb Ramp Type D" (2 EA).

Response: Added pay item "650.1500 Curb Ramp, Type Combination" (12 Each).

30. Question: On Sheet 51, the drainage plan shows the removal of 2 existing w8 lines but there is no bid item for the removal of the existing waterline. Please verify which bid line item would the removal of the existing waterline be paid under or if there will be a bid item added to the schedule of values for the waterline removal?

Response: Added pay item "202.0700 Removal of Existing Waterline" (2 Each).

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