STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

AIRPORTS

SPECIFICATIONS AND PROPOSAL

FOR

REPAIR OF ASPHALT CONCRETE PAVEMENT

AT

KAHULUI AIRPORT

STATE PROJECT NO. BM1642-33

KAHULU, MAUI, HAWAII

2026

NOTICE TO BIDDERS

Hawaii Revised Statutes (HRS),
Chapter 103D

The receiving of bids for **REPAIR OF ASPHALT CONCRETE PAVEMENT AT KAHULUI AIRPORT, MAUI, HAWAII, PROJECT NO. BM1642-33,** will begin as of the HIePRO Release Date. Bidders shall register and submit complete bids through HIePRO only. Refer to the following HIePRO link for important information on Vendor Registration: https://hiepro.ehawaii.gov/welcome.html.

The solicitation specifications, proposal, and additional documents designated or incorporated by reference shall be available in HIePRO.

HIePRO OFFER DUE DATE & TIME is May 28, 2026, at 2:00 p.m., Hawaii Standard Time (HST). **Bidders shall submit and upload the complete proposal to HIePRO prior to the offer due date and time. Proposals received after said due date and time shall not be considered. Any additional support documents explicitly designated as confidential and/or proprietary shall be uploaded as a separate file to HIePRO. Bidders shall not include confidential and/or proprietary documents as part of their proposal. The record of each bidder and their respective proposal shall be open to public inspection. FAILURE TO UPLOAD THE PROPOSAL TO HIePRO SHALL BE GROUNDS FOR REJECTION.**

The scope of work consists of asphalt concrete pavement repairs performed at Kahului Airport on an open end, "as-needed" basis.

To be eligible for award, bidders shall possess a valid State of Hawaii license General Engineering Contractor "A" license or Specialty Contractor "C-3" or "C-3a" license **at the time of bidding.**

The Hawaii Department of Transportation, Air and Water Transportation Facilities Division, 2016 GENERAL PROVISIONS FOR CONSTRUCTION PROJECTS, applicable to this project are available on the internet at: http://hidot.hawaii.gov/administration/con/.

A virtual pre-bid conference is scheduled for April 30, 2026, at 10:00 a.m., HST. Interested bidders shall contact Roger Ross, State Project Manager, directly at roger.r.ross@hawaii.gov, no later than April 29, 2026 at 12:00 p.m., HST to receive the meeting invitation. All prospective bidders and/or their respective representatives are encouraged to attend; however, attendance is not mandatory. All information presented at the pre-bid conference shall be provided for clarification and information only. Any amendments to the solicitation shall be made by formal addendum and posted in HIePRO.

All Request for Information (RFI) questions and Substitution Requests shall be submitted in HIePRO **no later than May 7, 2026, at 2:00 p.m., HST.** RFI questions received after the stated deadline shall not be addressed. Substitution Requests received after the stated deadline shall not be considered. Verbal RFI(s) shall not receive a response. All responses to RFI questions shall be provided for clarification and information only and issued by formal addendum. Any amendments to the solicitation shall be made by formal addendum and posted in HIePRO.

If there is a conflict between the solicitation and information stated in the pre-bid conference, the meeting minutes, and/or the responses to RFI questions, the solicitation shall govern and control, unless as amended by formal addendum.

Apprenticeship Preference. A five percent bid adjustment for bidders that are party to apprenticeship agreements pursuant to HRS § 103-55.6 is applicable to this project.

Employment of State Residents on Construction Procurement Contracts. Compliance with HRS § 103B-3 is a requirement for this project whereby a minimum of 80 percent of the bidder's work force on this project shall consist of Hawaii residents.

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

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

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

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

For additional information, contact Roger Ross, State Project Manager, by phone at (808) 895-2954, or by email at roger.r.ross@hawaii.gov.

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

CURT T. OTAGURO
Deputy Director of Transportation for Airports

HIePRO RELEASE DATE: April 23, 2026

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INSTRUCTIONS FOR CONTRACTOR'S LICENSING

"A" general engineering contractors and "B" general building contractors are reminded that due to the Hawaii Supreme Court's January 28, 2002 decision in Okada Trucking Co., Ltd. v. Board of Water Supply, et al., 97 Haw. 450 (2002), they are prohibited from undertaking any work, solely or as part of a larger project, which would require the general contractor to act as a specialty contractor in any area where the general contractor has no license. Although the "A" and "B" contractor may still bid on and act as the "prime" contractor on an "A" or "B" project *(See, HRS § 444-7 for the definitions of an "A" and "B" project.)*, respectively, the "A" and "B" contractor may only perform work in the areas in which they have the appropriate contractor's license *(An "A" or "B" contractor obtains "C" specialty contractor's licenses either on its own, or automatically under HAR § 16-77-32.)*. The remaining work must be performed by appropriately licensed entities. It is the sole responsibility of the contractor to review the requirements of this project and determine the appropriate licenses that are required to complete the project.

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

AIRPORTS DIVISION

SPECIAL PROVISIONS

SPECIAL PROVISIONS

The following additional amendments to the General Provisions are applicable to this project:

1.3 DEFINITIONS is amended as follows:

The definition for Subcontractor is deleted in its entirety and replaced with the following:

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.

The following definitions shall be added:

AASHTO - The American Association of State Highway and Transportation Officials.

Access Road - The right-of-way, the roadway and all improvements constructed thereon connecting the airport to a public roadway.

Air Operations Area (AOA) - The term air operations area (AOA) shall mean any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operation area shall include such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiway, or apron.

Apron - Area where aircraft are parked, unloaded or loaded, fueled and/or serviced.

ASTM International (ASTM) - Formerly known as the American Society for Testing and Materials (ASTM).

Bid - The offer of a Bidder, on the prescribed HDOT form, to perform the work and to furnish the labor and materials at the prices quoted.

Building Area - An area on the airport to be used, considered, or intended to be used for airport buildings or other airport facilities or rights-of-way together with all airport buildings and facilities located thereon.

Certificate of Analysis (COA) - The COA is the manufacturer's Certificate of Compliance (COC) including all applicable test results required by the specifications.

Certificate of Compliance (COC) - The manufacturer's certification stating that materials or assemblies furnished fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer's authorized representative.

Contractors Quality Control (QC) Facilities - The Contractor's QC facilities in accordance with the Contractor Quality Control Program (CQCP).

Contractor Quality Control Program (CQCP) - Details the methods and procedures that will be taken to assure that all materials and completed construction required by the contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors.

Control Strip - A demonstration by the Contractor that the materials, equipment, and construction processes results in a product meeting the requirements of the specification.

Drainage System - The system of pipes, ditches, and structures by which surface or subsurface waters are collected and conducted from the airport area.

Extra Work - An item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, but which is found by the Owner's Engineer or Resident Project Representative (RPR) to be necessary to complete the work within the intended scope of the contract as previously modified.

FAA - The Federal Aviation Administration. When used to designate a person, FAA shall mean the Administrator or their duly authorized representative.

Force Account – a) Contract Force Account - A method of payment that addresses extra work performed by the Contractor on a time and material basis. b) Owner Force Account - Work performed for the project by the Owner's employees.

HAWAII ePROCUREMENT SYSTEM (HIePRO) - The State of Hawaii eProcurement System for issuing solicitations, receiving proposals and responses, and issuing notices of award.

Intention of Terms - Whenever, in these specifications or on the plans, the words "directed," "required," "permitted," "ordered," "designated," "prescribed," or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the Engineer and/or Resident Project Representative (RPR) is intended; and similarly, the words "approved," "acceptable," "satisfactory," or words of like import, shall mean approved by, or acceptable to, or satisfactory to the Engineer and/or RPR, subject in each case to the final determination of the Owner. Any reference to a specific requirement of a numbered paragraph of the contract specifications or a cited standard shall be interpreted to include all general requirements of the entire section, specification item, or cited standard that may be pertinent to such specific reference.

Lighting - A system of fixtures providing or controlling the light sources used on or near the airport or within the airport buildings. The field lighting includes all luminous signals, markers, floodlights, and illuminating devices used on or near the airport or to aid in the operation of aircraft landing at, taking off from, or taxiing on the airport surface.

Major and Minor Contract Items - A major contract item shall be any item that is listed in the proposal, the total cost of which is equal to or greater than 20% of the total amount of the award contract. All other items shall be considered minor contract items.

Owner - The term "Owner" shall mean the party of the first part or the contracting agency signatory to the contract. Where the term "Owner" is capitalized in this document, it shall mean airport Sponsor only. The Owner for this project is the State of Hawaii, Department of Transportation, Airports Division.

Pavement Structure - The combined surface course, base course(s), and subbase course(s), if any, considered as a single unit.

Payment Bond - The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will pay in full all bills and accounts for materials and labor used in the construction of the work.

Performance Bond - The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will complete the work in accordance with the terms of the contract.

Project - The agreed scope of work for accomplishing specific airport development with respect to a particular airport.

Proposal Guaranty - The security furnished with a proposal to guarantee that the bidder will enter into a contract if their own proposal is accepted by the Owner.

Quality Assurance (QA) - Owner's responsibility to assure that construction work completed complies with specifications for payment.

Quality Control - Contractor's responsibility to control material(s) and construction processes to complete construction in accordance with project specifications.

Quality Assurance (QA) Inspector - An authorized representative of the Engineer and/or Resident Project Representative (RPR) assigned to make all necessary inspections, observations, tests, and/or observation of tests of the work performed or being performed, or of the materials furnished or being furnished by the Contractor.

Quality Assurance (QA) Laboratory - The official quality assurance testing laboratories of the Owner or such other laboratories as may be designated by the Engineer or RPR. May also be referred to as Engineer's, Owner's, or QA Laboratory.

Resident Project Representative (RPR) - The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for all necessary inspections, observations, tests, and/or observations of tests of the contract work performed or being performed, or of the materials furnished or being furnished by the Contractor and acting directly or through an authorized representative.

Runway - The area on the airport prepared for the landing and takeoff of aircraft.

Runway Safety Area (RSA) - A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft. See the construction safety and phasing plan (CSPP) for limits of the RSA.

Subgrade - The soil that forms the pavement foundation.

Supplemental Agreement - A written agreement between the Contractor and the Owner that establishes the basis of payment and contract time adjustment, if any, for the work affected by the supplemental agreement. A supplemental agreement is required if: (1) in scope work would increase or decrease the total amount of the awarded contract by more than 25%: (2) in scope work would increase or decrease the total of any major contract item by more than 25%; (3) work that is not within the scope of the originally awarded contract; or (4) adding or deleting of a major contract item.

Taxilane - A taxiway designed for low speed movement of aircraft between aircraft parking areas and terminal areas.

Taxiway - The portion of the air operations area of an airport that has been designated by competent airport authority for movement of aircraft to and from the airport's runways, aircraft parking areas, and terminal areas.

Taxiway/Taxilane Safety Area (TSA) - A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an aircraft. See the construction safety and phasing plan (CSPP) for limits of the TSA.

2.7 REQUEST FOR SUBSTITUTION OF SPECIFIED MATERIALS AND EQUIPMENT BEFORE BIG OPENING is amended as follows:

1. The last sentence in the first paragraph (line 147 to 152) shall be replaced with the following:

"Where a bidder intends to use a material or equipment of an unspecified brand, make, or model, the bidder must submit a request to the Department for review and approval at the earliest date possible. As specified in the Notice to Bidders, all requests shall be posted as a question in HIePRO under the "Question and Answer" tab. Supporting documents for specific request shall be emailed to the Project Manager specified in the Notice to Bidders. Request must be posted in HIePRO and supporting documents received by the Project Manager no later than twenty-one (21) calendar days before the bid opening date."

2. The first sentence in the second paragraph (line 154 to 156) shall be replaced with the following:

"It shall be the responsibility of the bidder to submit sufficient evidence based upon which a determination can be made by the Department that the alternate brand is a qualified equivalent."

2.8 PREPARATION AND DELIVERY OF BID is amended as follows: Last Paragraph (line 189 to 192) shall be replaced with the following:

"**Bidders shall submit and upload the complete proposal to HIePRO prior to the bid opening date and time. Proposals received after said due date and time shall not be considered. Any additional support documents explicitly designated as confidential and/or proprietary shall be uploaded as a separate file to HIePRO. Do not include confidential and/or proprietary documents with the proposal.** The record of each bidder and respective bid shall be open to public inspection. Original (wet ink, hard copy) proposal documents are not required to be submitted. **Contract award shall be based on evaluation of proposals submitted and uploaded to HIePRO.**

FAILURE TO UPLOAD THE COMPLETE PROPOSAL TO HIePRO SHALL BE GROUNDS FOR REJECTION OF THE BID.

If there is a conflict between the specification document and the HIePRO solicitation, the specifications shall govern and control, unless otherwise specified."

2.11 BID SECURITY - delete Section 2.11(a) in its entirety and replace it with the following:

"(a) Unless directed otherwise in the invitation for bids, each bid shall be accompanied by bid security which is intended to protect the Department against failure or refusal of a bidder to execute the contract for the work bid or to supply the required performance and payment bonds. In as much as the Contract to be executed is an Open-End contract under which the contract price, or total amount to be paid the Contractor cannot be determined at the time the contract is executed, the bid security required shall be as follows:

Bid Security Amount $75,000.00

Bid security shall be one of the following forms:

1. A deposit of legal tender,

2. A valid surety bid bond, underwritten by a company licensed to issue bonds in the State of Hawaii, in the form and composed, substantially, with the same language as provided herewith and signed by both parties, or

3. A certificate of deposit; credit union share certificate; or cashier's, treasurer's, teller's' or official check drawn by or a certified check accepted by a bank, savings institution, or credit union insured by the Federal Deposit Insurance Corporation (FDIC) or the National Credit Union Administration (NCUA) and payable at sight or unconditionally assigned to the Department. These instruments may be utilized only to a maximum of one hundred thousand dollars ($100,000.00). If the required amount totals over one hundred thousand dollars ($100,000.00), more than one instrument not exceeding one hundred thousand dollars ($100,000.00) each and issued by different financial institutions shall be accepted.

If bidder elects options (1) or (3) above for its bid security, said bid security shall be in its <u>original form</u> and shall be <u>submitted before the bid deadline</u> to the Contract Office, Department of Transportation, Aliiaimoku Hale, 869 Punchbowl Street, Room 103, Honolulu, Hawaii 96813. Original surety bid bonds do <u>not</u> need to be submitted to the Contracts Office. Bidders are reminded that a copy of its surety bid bond shall be <u>included with its bid</u> submitted and uploaded to HIePRO."

<u>2.12 PRE-OPENING MODIFICATION OR WITHDRAWAL OF BIDS</u> is amended by deleting 2.12 Pre-Opening Modification or Withdrawal of Bids in its entirety and replace with the following:

"2.12 PRE-OPENING MODIFICATION OR WITHDRAWAL OF BIDS. Bids may be modified or withdrawn prior to the bid opening date and time. Withdrawal or revision of proposal shall be completed, submitted and uploaded to HIePRO prior to the bid opening date and time."

<u>2.14 PUBLIC OPENING OF BIDS</u> is amended by deleting 2.14 Public Opening of bids in its entirety

<u>2.20 BID EVALUATION AND AWARD</u> is amended as follows: Paragraph (a) shall be replaced with the following:

"(a) The award shall be made to the lowest, responsive, responsible bidder within ninety (90) days after bid opening and shall be based on the criteria set forth in the invitation for bids. The Department may request the bidders to allow the Department to consider the bids for the issuance of an award beyond the 90 day period. Agreement to such an extension must be made by a bidder in writing. Only bidders who have agreed to such an extension will be eligible for the award." No response to request shall mean the bidder shall no longer be eligible for award.

<u>2.24 REQUIREMENTS OF CONTRACT BONDS</u> is amended by deleting 2.24(c) in its entirety and replacing with the following:

"(c) Prior to execution of the contract, the successful bidder shall file a good and sufficient performance bond and payment bond on the forms furnished by the Department. In as much as the

contract to be executed is a price-term, open end, or requirements contract under which the contract price, or total amount to be paid the Contractor cannot be determined at the time the contract is executed, the performance and payment bond amounts required shall be as follows:

Performance Bond.....$1,500,000.00

Payment Bond.....$1,500,000.00

The Contractor shall submit the required contract bond(s) together with the signed contract in accordance with Section 2.25 Execution of Contract.

The above amounts represent the performance and payment bond amounts required for the initial term of the contract. If work orders issued during the initial contract term exceed the original bond requirements, the procurement officer shall require additional performance and payment bonds to cover said work orders.

If the contract is extended beyond the initial term, the State shall require new bonds for each subsequent term. Such performance and payment bonds for each subsequent term, may be extensions of the original bond(s) by endorsements thereto, provided that, as to any claims which may have arisen or may arise while said bonds were in effect, said bonds shall remain in full force and effect.

The performance and payment bond amounts may be reduced upon written determination by the head of the purchasing agency, if it is deemed to be in the best interest of the State."

2.25 EXECUTION OF CONTRACT is amended by deleting 2.25 Execution of Contract in its entirety and replacing it with the following:

"2.25 Execution of Contract. The contract, contract performance and payment bonds, and HRS Chapter 104 Compliance Certificate, shall be executed by the successful bidder and returned within ten (10) days or within such further time as the Department may allow after the bidder has received the contract for execution. The contract shall not bind the State in any way unless said contract has been fully and properly executed by all the parties thereto, the Comptroller has endorsed thereon its certificate that there is available an unexpended appropriation over and above all outstanding contracts, sufficient to cover the amount required by the contract, and the fully executed contract is received by the Contractor. If the Contractor fails to execute the contract and file acceptable bond(s) within ten (10) days, or within such further time as the Department may allow, the Department may cancel the award and award the contract to the next lowest, responsive and responsible bidder. The Department may recover its damages against the bid security as described in Subsection 2.11(c) herein."

4.12 UTILITIES AND SERVICES - is amended as follows:

Add the following after the last paragraph:

"(e) Repairs and Outages.

(1) The Contractor shall have available on 24-hour call sufficient specialty contractors, such as electrical and plumbing contractors, to repair any damage to existing facilities that might occur as a result of construction operations regardless of when the damage might occur.

(2) Outage: Written requests for power outage, communication changes, and water and sewer

connection outages shall be submitted to the Engineer at least seven (7) days in advance or as specified in other sections of these specifications. Outages will be restricted to non-peak operational hours between midnight and 6:00 a.m."

7.21 PUBLIC CONVENIENCE AND SAFETY - is hereby added to the General Provisions:

"It shall be especially noted by the Contractor that the area directly adjacent to the existing in use runways and taxiways, is an extremely hazardous area and that very strict controls will apply throughout the entire period required to complete all work within 500 feet from the edge of an in use runway and 180 feet from the edge of an in use taxiway.

The Contractor shall familiarize himself with the Airport Certification Manual available for review at the Airport Manager's Office and shall comply with its requirements.

The Contractor is responsible for the security of access points to the Airport Operational Area that are located within the limits of construction and will be fined $1,000 per incident for any breach of security at these locations. All gates leading into the AOA shall be kept locked and if required to be open, the Contractor shall provide professional security guards to attend gates. The guards must be approved by the Director and shall be required to attend a training session conducted by the Airport Manager prior to gate assignment."

8.20 LIMITATION OF OPERATIONS: is hereby added to the General Provisions:

"The following limitations shall be observed by the Contractor when operating within 75 feet from the edge of any taxiway.

General - The Contractor shall schedule his operations to minimize interference with the movement of aircraft or passengers as may be required by the Engineer. The Contractor shall be responsible to alert all of his personnel to the location of power and signal cables installed for the operation of the airport. The Contractor shall control his operations in a manner to preclude any possible damage to those cables. Utility companies shall be notified by the Contractor one week before commencement of work. The Contractor shall give notice to the Engineer in writing, at least 168 hours before operating within 75 feet from the edge of any taxiway and the Engineer will assure himself that the Airport Management personnel are notified in sufficient time to publish the warning (NOTAM). The Contractor shall immediately repair any damages to the existing perimeter fence to prevent inadvertent entry to the Airport Operation Area (AOA).

Work in Vicinity of Runways and Taxiways in Use - Under the terms of this contract, it is intended that work shall be completed without disturbing the paved surface of existing runways and taxiways, unless shown otherwise on the plans.

Aircraft traffic shall not be interrupted. The Contractor shall schedule to work within 75 feet of the taxiway as directed by the Airport Management. No ruts, holes, or open trenches of 3 inches or more in depth and no objects or material 3 inches or more in height shall be permitted within the safety area when the airfield is in operation in conformance to Federal Aviation Regulation Part 139. The Contractor is also informed that Airport Zoning Regulations dictate that a 'clear zone' be maintained 500 feet on each side of an active runway, to be known as a hazardous area. The Contractor shall comply with all regulations governing ground operations within hazardous areas. The following FAA Advisory Circulars ·or later versions and FAA Regulations specify these requirements.

AC 150/5210-5D Painting, Marking, and Lighting Vehicles Used on an Airport, dated April 2010

AC 150/5340-lM Standards for Airport Markings, dated May 2019

AC 150/5370-2G Operational Safety on Airports During Construction, dated December 2017

FAA Regulations Objects Affecting Navigable Airspace Part 77

The Contractor shall keep all personnel and equipment off the areas not specifically designated for work under this Contract. At all times when the Contractor's equipment is not in use, the equipment shall be moved outside the hazardous areas to an area designated by the Engineer. Under no condition shall equipment be parked, or material stored within the hazardous areas.

Failure on the part of the Contractor to abide by the above will result in suspension of work.

Authority of Control Tower Personnel - With the exception of actual construction methods, the airport control tower personnel will have full authority to control the Contractor's movements within the existing taxiway. When required, the Contractor shall maintain a constant radio vigil within all work areas and in addition shall keep at least one flagman on duty with the radio man. When notified by the control tower to temporarily halt operations, it shall be the duty of the flagman, through the use of appropriate methods (lighted flares shall not be used under any circumstances), to notify all operators of equipment and other personnel to cease work and move men and equipment off of hazardous areas. Contractor shall provide, at his own expense, the necessary radio and equipment including a radio equipped mobile vehicle to maintain contact with control tower personnel at all times during job performance. A transceiver operating at a frequency designated by the Engineer to communicate with the Control Tower.

Marking of Hazardous Areas - The Engineer will designate areas that are hazardous for aircraft. The Contractor shall provide red blinker lights spaced not more than 50 feet apart around all hazardous areas and areas of work within 75 feet of any taxiway. Such systems shall be subject to approval by the Engineer. The Contractor shall have personnel on call 24 hours per day for the emergency maintenance of hazard markings.

The Contractor shall provide red flags not less than 20 inches square in addition to the red blinker lights. When danger flags are made of fabric, a wire stiffener shall be used to hold the flags in an extended position. Flags shall be so mounted that they do not produce a hazard. The red danger flags shall be spaced not more than 50 feet apart around all areas of work within 75 feet of any taxiway.

All systems proposed by the Contractor for lighting and barricading shall be submitted to the Engineer for review prior to installation. The Contractor shall install all flags, lighting and barricades as required by the Engineer. Such systems shall be subject to approval by the Engineer.

Storage of Equipment and Materials - At the end of each working shift, all of the Contractor's equipment shall be withdrawn to an area designated by the Engineer. The Contractor shall park all equipment in an orderly fashion and place a sufficient number of red flasher lights to identify these areas. Materials stored within the airport shall be so placed and the work shall, at all times, be so conducted as to cause no greater obstruction to the air and ground traffic than is considered necessary by the Engineer. No runways, taxiways or roadways shall be closed or opened, except by permission of the Engineer.

Utilities - The Contractor shall provide for the protection of all utilities from damages in areas to be traversed by his vehicles and equipment. If required, buried cables and utility lines shall be protected by mounding earth over the cables or by any other method approved by the Engineer.

The Contractor shall notify representatives of the owner, agencies, and other affected organizations at least 48 hours prior to working in any area containing the facilities of these organizations.

Failure to notify the owning organization will prevent authorization to work in a specific area.

Archaeological Features - Any archaeological features such as petroglyphs, burial sites, and artifacts discovered or unearthed during the performance of the work shall immediately be brought to the attention of the Engineer and all work that would damage or destroy these features shall be discontinued. The Engineer will decide, after proper investigation, to salvage or abandon such artifacts."

8.21 OPERATION OF CONTRACTOR'S MOTOR VEHICLE AND PERSONNEL IN RESTRICTED AIR OPERATIONS AND MOVEMENT_AREAS is hereby added to the General Provisions:

"The contractor shall conform with the all sections of the "State of Hawaii, Department of Transportation, Airports Division, Contractor's Training Guide" pertaining to access and operation in the Airport Operation Area (AOA) hereinafter described as follows:

"A. Motor Vehicles in Airport Operation Area
for safety reasons, the operation of motor vehicles in the AOA must conform with all applicable State Airport rules and regulations."

B. Motor Vehicle Access Permit

Each motor vehicle operated in the AOA is required to:

1. Meet all State licensing registration and safety requirements and be specifically licensed for operation in the AOA.
2. Meet all insurance requirements.
3. Be restricted to operation by those persons qualified to drive the vehicle and in possession of a current Ramp Driver's License and applicable Motor Vehicle Operator's License.

C. The operators of motor vehicles in the AOA shall be responsible for meeting the following insurance requirements.

1. Licensed Vehicles

As a condition for authorization to enter the AOA, the Contractor shall provide evidence of vehicle liability insurance in the form of a Certificate of Insurance issued by an authorized insurance carrier. Automobile Liability and general Liability (combined single limit, Bodily Injury and Property Damage, per occurrence) shall be required in the applicable minimum limits specified below:

a. Daniel K. Inouye International Airport

(1) Standard AOA clearance.... $5,000,000

(2) Limited AOA clearance .....$1,000,000 Limited AOA clearance is defined as operations restricted to Diamond head and Ewa Concourses second level roadways and connecting third level main terminal roadway only, with entry and exit via Security Access Point "C" (Primary) and Access Point "A" (Secondary)

b. Other Airports

Standard AOA clearance.....$1,000,000
Standard AOA clearance is defined as any portion of a public Airport from which the public is restricted by fences or appropriate signs and no leased or demised to anyone for exclusive use and shall include runways, taxiways, all ramp and apron areas, aircraft parking and storage areas, fuel storage areas, maintenance areas, and any other area of a public Airport used or intended to be used for landing, takeoff, or surface maneuvering of aircraft or used for embarkation or debarkation of passengers.

2. Unlicensed Vehicles

Airport Liability (or General Liability) shall be required in the applicable minimum

limits specified below:

a. Daniel K. Inouye International Airport, Kahului Airport and Ellison Onizuka Kona International Airport at Keahole

AOA clearance.....$5,000,000

b. All other Airports

AOA clearance.....$1,000,000

3. Specifically name the State of Hawaii as additionally insured.

4. Indicate that the Airport Engineer will be provided with a 30-day written prior notice of policy cancellation or material change in coverage or conditions.

D. Operator's Permit

1. No person shall operate a motor vehicle on the AOA unless he holds and carries on his person a current Airport Motor Vehicle operator's permit issued by the State of Hawaii, Department of Transportation, Airports Division.

2. Operator's permits will only be issued to persons who apply through the Airport District Security Office and pass a written exam covering those portions of the Airport Rules and Regulation relating to the operation of vehicles in Airport Operations Areas.

E. Authorized Vehicles

1. Only vehicles considered operationally safe and necessary for the performance of this contract may be allowed to operate in the AOA.

2. All motor vehicles must be painted in such a manner so as to be easily identifiable and must carry the Contractor's name on each side. These signs may be of a temporary nature applied to the side windows or doors.

The lettering shall be in bold characters of a minimum of four (4) inches in height and one and one-half (1-1/2) inches in widths, the height of logos should be a minimum of six (6) inches.

3. The Contractor's operations on, over, across, and/or immediately adjacent to any runway and/or taxiway at a towered airport shall require the use of two-way radio communication. The Contractor shall obtain the necessary equipment at his own expense.

4. No person shall operate a motor vehicle on the AOA unless he holds and carries on his person a current Motor Vehicle Operator's Permit issued by the Airport Manager.

a. The Motor Vehicle Operator's Permit will be issued only to persons who apply through the Airport Security Section and pass a written exam covering those portions of the Airport Rules and Regulations relating to the operation of vehicles in the AOA.

b. Permits issued may be suspended or revoked for cause at any time by the Airports Division.

F. Airport Operation Area Construction Pass

1. Issuance of Airport Operation Area (AOA) Construction Passes shall be limited

to contractors, subcontractors, companies, organizations, individuals engaged in authorized and approved construction activity which requires a continuing need for entry into the AOA or Airfield Movement Areas Request letters for such passes must be made to the Airport District Manager's Office in accordance with the Contractors Training Guide or applicable District requirements.

2. As a condition for security area clearance, applicants must comply with Transportation Security Regulation 1542 which requires a ten-year background Criminal History Records Check for those individuals employed under this contract.

G. Access to Movement Areas

1. Movement areas shall mean all of the runways and taxiways of the Airport which are utilized for taxiing, takeoff, and landing of aircraft.

   a. Any vehicle which requires access to the movement area shall be equipped with operational radio equipment capable of positive two-way contact with Tower/Ground Control.

   b. Operators of vehicles in movement areas must possess knowledge and familiarity with restricted and airfield movement areas, operational rules, regulations, and procedures, or be under direct escort by individuals meeting all of the above requirements.

2. Vehicle Operations on Movement Areas

   a. No vehicle shall proceed across any runway unless specifically cleared by Tower/Ground Control.

   b. The operator of a vehicle in the movement area shall not leave his vehicle unless continuous radio contact is maintained with the Tower/Ground Control while he is away from his vehicle.

   c. Any vehicle proceeding onto the movement area between the hours of sunset and sunrise shall be equipped with an overhead flashing light which is visible for one (1) mile, unless such vehicle is being escorted by another vehicle so equipped.

   d. All vehicles operated on the movement area between sunrise and sunset except those being escorted, shall operate an overhead amber or red flashing beacon visible for at least one (1) mile; or display a flag at least three (3) feet square with orange and white checkered squares of not less than one (1) foot on each side.

H. Runway and Taxiway Closure

1. Requests for runway or taxiway closures, or for any work which affect operational conditions at the airport must be made in writing through the Airport Engineering Branch.

2. Temporarily closed runways require placement of a lighted “X” runway closure marker on top of the runway identification numerals at both ends of the closed runway.

3. Taxiway closures require placement of barricades with alternate orange and white

markings at each end of the closed taxiway segment. Barricades must be supplemented with flashing red lights. The intensity of the lights and spacing for barricades, and lights must adequately define and delineate the hazardous area.

I. Gate Guards Furnished by Contractors

1. If a contractor is permitted by the airport to maintain operational control of an AOA Access Gate, entry through such gate shall be controlled by the posting of a gate guard.

   a. Written instruction will be provided, outlining the guard's duties to enforce those requirements and provisions prescribed by the airport's security program to include all personnel and vehicle entry and access requirements.

   b. Procedures will be established to identify the actions which will be undertaken by the guard in calling for assistance.

   c. An approved emergency communications procedure will be established.

J. Compliance

1. The contractor shall comply with all regulations and rules governing the Air Operations Areas during construction, as specified in the following or later versions:

   a. Hawaii Revised Statutes, Title 19, Administrative Rules for Public Airports.

   b. Federal Aviation Administration Advisory Circular AC 150/5340-l, Standards for Airport Markings; AC 150/5370-2, Operational Safety on Airports During Constructions.

K. Enforcement Authorization

Act 21, Section 1, Section 261-17(a), HRS; Federal Aviation Administration Regulations, Part 139, Part 107.

L. Right of Rejection or Revocation

The State of Hawaii, Airports Division, reserves the right to withhold, deny or revoke any airport security clearance, licenses or permits to any individual or organization who fails to meet the prescribed or required access area clearance criteria to include background investigation information, or fails to observe or comply with established rules, regulations, and directives.

It should be clearly understood that such denial or revocation is based solely on airport security or safety considerations and does not in any way constitute a determination by the State with regard to private employment by any individual or organization."

--------END OF SECTION------

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

AIRPORTS DIVISION

SPECIFICATIONS

PART I

GENERAL PROVISIONS

The Hawaii Department of Transportation AIR and WATER Transportation Facilities Division General Provisions for Construction Projects dated 2016 is not physically included in these specifications. The General Provisions are available at

http://hidot.hawaii.gov/administration/con/

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HONOLULU, HAWAII

SPECIFICATIONS

PART II

TECHNICAL PROVISIONS

SECTION 01000 - DESCRIPTION OF WORK

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

The General Provision of the contract, including the General Provisions for Construction Projects (2016), Special Provisions, and General Requirements of the Specifications, apply to the work specified in this section.

1.2 SUMMARY

The work to be performed under this Contract is on an as-needed basis as determined by the State. Work shall include all labor, equipment, and materials necessary to complete the following work items:

A. Apply herbicide.

B. Clear vegetation and clean cracks.

C. Route and seal pavement cracks.

D. Reconstruct aggregate base course.

E. Construct asphalt pavement patches.

F. Apply seal coat.

G. Sawcut pavement grooves.

H. Airfield marking application.

1.3 LOCATION OF THE WORK

A. The work to be performed under this contract is located at:
Kahului Airport at Kahului, Maui Island

B. Projects are within a controlled area closed to public access, the Airports Operational Area (AOA). The Contractor shall meet requirements for working within the AOA as described in the Paragraph 1.4 AOA Safety and Security.

C. The airport shall remain operational at all times. Any damages to existing areas caused by the Contractor shall be repaired by the Contractor at no cost to the State.

1.4 AOA SAFETY AND SECURITY

A. AOA Badges – All personnel accessing the AOA shall have AOA Badges with unescorted access issued by the Airport. AOA temporary escort badges shall be used only when the State determines that an emergency requires such use.

B. AOA Access Points – The Contractor shall be assigned only one access point for work phase. All personnel, vehicles, and equipment must enter and exit the AOA only through the assigned access point.

C. AOA Access Gates – Should the Contractor's assigned AOA access point be through an unguarded gate, the Contractor shall coordinate with the State to open and close the access gate. If the State determines that airport personnel are not available to provide gate access, the Contractor shall be responsible for the following:

1. Obtain AOA access gate keys from the Airport Security Office including any security deposit for the key(s).
2. Provide a gate guard familiar with all AOA security access requirements; knowledge of AOA access badge, AOA vehicle decal, and airport vehicle operator requirements; and a communication device and instructions to call for assistance whenever problems occur.
3. Proper control of the access gate in accordance with all airport security procedures.
4. Close the AOA gate during periods of prolonged inactivity and close and lock the gate whenever the gate is not in use or is unattended.

D. The Contractor shall develop a Construction Safety and Phasing Plan for the proposed work on the airfield and submit to the Airport Manager for approval.

1.5 AOA OPERATIONAL REQUIREMENTS

The Contractor shall be responsible for all their personnel and vehicle movements on the AOA. Should the State determine that a driver is failing to comply with airport regulations or instructions, the driver may be terminated or suspended and required to undergo additional training.

A. AOA Communication Devices – The Contractor shall have a dedicated radio monitoring person on the AOA whenever Contractor personnel are on site. The radio monitoring person's sole responsibility shall be to monitor the radio and relay any necessary instructions to the work crews. The radio monitoring person shall have no other duties while on the AOA. The Contractor shall provide the following communication devices:

1. A two-way radio capable of communicating on aviation frequencies including but not limited to:

Kahului Airport – 118.7 (Tower) and 121.9 (Ground)
Cellular telephone with a listing of all required emergency contact numbers.

B. AOA Travel Routes – The Contractor will be assigned only one travel route per work area and shall ensure that all their personnel, vehicles, and equipment traverse the AOA only along the designated route. If the State determines that an emergency has made the designated route unusable, a temporary travel route will be assigned.

C. AOA Authorized Vehicles – Only vehicles considered safe and required to complete the Contractor's work shall be allowed to operate on the AOA. Each vehicle operating on the AOA must possess:

1. An AOA vehicle decal obtained from the Airport Security Office and displayed on the driver side front bumper. AOA temporary vehicle decals shall only be issued when the State determines that an emergency requires such use.
2. Insurance coverage as required by Article 7.1 of the General Provisions and as amended by the Special Provisions.

D. Vehicle and Equipment Requirements on the AOA – Each vehicle and driven piece of equipment shall possess the following when operating within the AOA.

1. Operations occurring at night or during periods of poor visibility shall require a flashing amber beacon mounted to the vehicle/equipment's highest point.

2. Daylight operations with clear visibility shall require a checkered orange and white flag attached to a staff that is mounted to each vehicle/equipment in lieu of a flashing amber beacon. The flag shall be at least 3 foot square with a checkered pattern of international orange and white squares that are at least 1 foot on each side.

3. Placards shall be on both sides of each vehicle or equipment at all times to identify the vehicle or equipment owner. Placards shall contain the company name in letters at least 4" tall or company logo at least 6" high.

4. All additional equipment marking, lighting, and positioning that may be required by the FAA.

E. AOA Drivers – All people operating a vehicle or any driven piece of equipment on the AOA shall possess the following license, permit, and expertise:

1. Current and valid Hawaii State Driver's License.

2. Current and valid Airport Vehicle Operator's Permit.

3. Complete airport familiarization.

4. An understanding and ability to identify the following;
    a. All RSAs and TSAs.
    b. All AOA Markings, Lighting, and Signing
    c. The need for control of FOD.
    d. All AOA Equipment for Aircraft.
    e. All AOA critical areas.
    f. All AOA travel routes for the various work phases.

5. An understanding and ability to follow all ground vehicle operation and communication requirements while operating on the AOA.

F. Airport Vehicle Operator's Permit - Shall only be issued to people that apply through the Airport Security Office, and pass a written exam covering portions of the Airport Rules and Regulations related to vehicle operations on the AOA. The State may suspend or revoke an issued permit at any time for cause.

G. AOA Traffic Control - The Contractor shall furnish and provide the following traffic control devices as needed and can utilize airport equipment as available:

1. Runway Lighted X's - Whenever working within an RSA.
2. Low-Profile Barricades - Shall be used to designate areas closed to aircraft traffic and shall meet the requirements of AC 150/5370-2 (latest version).

H. AOA FOD Control - The Contractor shall keep all work areas, AOA travel routes, and all adjacent areas clean at all times. Unless otherwise directed by the Airport Manager, the Contractor shall properly haul and dispose all removed pavement materials and collected debris to a site off the Airport. The State will notify the Contractor to perform remedial cleaning whenever their FOD Control Operations are unsatisfactory. Upon notification, the Contractor shall be at the jobsite ready to perform remedial cleaning within one hour. Notification by telephone will be deemed as official.

I. Airport Staging Areas - The Contractor shall only stage its vehicles and equipment at State approved areas. No vehicle/equipment shall park within 4' of a security fence. Demarcation of the staging area shall be as follows:

1. Weighted Lighted Barricades shall be placed around the staging area perimeter at a maximum of 20' on center; and
2. Yellow Barrier Tape with the words" CAUTION DO NOT ENTER" continuously printed on the tape shall be used with barricades to demarcate the staging area perimeter.

1.6 COORDINATION OF CONSTRUCTION ON THE AOA

Work on the AOA requires Rwy and Twy closures that demand proper notification to numerous agencies responsible for public safety; hence, the Contractor shall only cancel work through the Airport Manager, Airport Operations Manager, or Airport Duty Manager. Whenever a cancellation is not made, and the Contractor is not at the assigned AOA Access Point within 30-minutes of the start time; all Contractor closures will be cancelled. The Contractor shall reimburse the State $600.00 for every cancellation the State deems unjustified. The reimbursement is to compensate the State for all unnecessary costs related to canceling existing and coordinating new closures.

1.7 CONSTRUCTION LIGHTING REQUIREMENTS

Should any part of the work area lack sufficient sunlight, the Contractor shall provide sufficient artificial lighting to permit the work and inspection to be carried out efficiently, thoroughly, safely, and satisfactorily. Work and inspections shall not be performed with only flashlights and/or vehicle/equipment headlights. All lights shall be positioned so they do not blind aircraft pilots, or FAA-ATCT controllers. All wiring for electrical lights and power shall be properly installed, maintained, securely fastened and kept as far as possible from telephone and signal wires.

1.8 ENVIRONMENTAL AND HEALTH REQUIREMENTS

The Contractor shall perform the following in accordance with all applicable federal, state, local, and airport rules and regulations related to environmental pollution control, abatement, and fire code.

A. Airport Water - Airport water shall not be drawn from a tap lacking a reverse pressure principal backflow prevention device. Water valves shall be opened and closed so that water hammers are not produced. The Contractor shall furnish and install this type of equipment, as well as all fittings, appurtenances and bracings needed for the proper installation; and the Contractor shall remove all devices upon completion of their work.

B. Waste Disposal - Shall be performed properly. Materials shall not be burned, and construction waste shall not be disposed into Airport storm water or sewer systems.

C. Restoration - Completely restore, to an acceptable condition, staging areas, work areas, AOA travel routes, and areas adjacent to the aforementioned.

D. Vehicle/Equipment Leaks and Material Spills - Shall be handled by the following five-step process and pertains to all fluids other than potable water.

1. All leaked or spilled fluids shall immediately be kept from entering the Airport storm water and sewer systems.
2. All fluid leaks or spills shall be respectively fixed or stopped, immediately after ensuring that the fluids are kept out of the Airport storm water and

sewer systems.

3. All areas containing the leaks or spills shall be properly cleaned and restored.
4. Dispose all waste per Paragraph 1.8.B above.
5. Submit proper documentation to the State showing that all leaks or spills were properly cleaned and disposed.

E. Dust Control - Is required during all interior and exterior construction operations.

1.9 OTHER REQUIREMENTS

The Contractor shall also comply with the following requirements should they arise.

A. Any new TSA security requirement.

B. Any additional operational safety requirements generated by the FAA.

C. Provide additional lights along AOA travel routes should the Engineer deem additional safety enhancements are needed.

D. Any new environmental and health requirements generated by the EPA or DOH.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION (Not Used)

PART 4 – MEASUREMENT AND PAYMENT

4.1 BASIS OF MEASUREMENT AND PAYMENT

Work under this section will not be measured nor paid for separately but shall be considered incidental to and included in the bid prices for the various items of work in this project.

END OF SECTION

SECTION 01560 – GENERAL ENVIRONMENTAL, HEALTH, & SAFETY CONTROLS

PART I – GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 DESCRIPTION

This section addresses the prevention of environmental pollution as the result of construction operations under this contract. For the purpose of this specification, environmental pollution is defined as the presence of chemical, physical, or biological elements or agents that adversely affect human health or welfare, unfavorably alter ecological balances of importance to human life, adversely affect other species of importance, or degrade the utilization of the environment for aesthetic and recreational purposes.

1.03 REFERENCES

All work shall conform to the most recent edition of the following Federal, State, and Local regulations, unless otherwise noted or specified on the drawings or in these specifications. Where conflicts among the requirements or with these specifications exists, the most stringent requirements shall apply.

A. DOTA Construction Site Runoff Control Program
http://hidot.hawaii.gov/airports/doing-business/engineering/environmental/construction-site-runoff-control-program

1. DOTA Construction Activities Best Management Practices (BMP) Field Manual.

B. Department of Health (DOH) Hazard Evaluation & Emergency Response (DOH HEER) https://health.hawaii.gov/heer/

C. State of Hawaii Administrative Rules, Title 11, Department of Health (DOH)

1. Chapter 46, Community Noise Control.

2. Chapter 59, Ambient Air Quality.

3. Chapter 60.1, Air Pollution Control.

4. Chapters 260.1, 261.1, 262.1, 263.1, 264.1, 265.1, 266.1, 268.1, 270.1, 271.1, 273.1, and 279.1, Hazardous Waste Management.

5. Chapter 451, State Contingency Plan.

6. Chapter 501, Asbestos Requirements.

D. CFR Title 40, Protection of the Environment, Chapter I, Environmental Protection Agency.

E. CFR Title 42, Public Health, Chapter I, Public Health Service, Department of Health and Human Services.

1.04 SUBMITTALS

A. The Contractor shall submit the following items as required:

1. Individual Wastewater System (IWS) Final Report: For projects involving the construction of an individual wastewater system, an IWS Final Report is required to be submitted to the DOTA Engineering Branch, Environmental Section (AIR-EE) for approval, prior to submitting to DOH Wastewater Branch and prior to project closeout.

2. Underground Injection Control (UIC) Well Final Report: For new drainage well construction and existing drainage well modification, a UIC Well Final Report is required to be submitted to AIR-EE for review and approval, prior to submitting to DOH Safe Drinking Water Branch (SDWB), and prior to project closeout. The Final Report shall also be submitted within the deadline specified on the UIC Approval to Construct. If a project involves abandoning an existing drainage well, written instructions shall be obtained from DOH SDWB and a copy provided to AIR-EE prior to backfilling the demolished well. All supporting documentation requested by DOH post demolition work shall be completed and provided to AIR-EE for review prior to submitting to DOH SDWB.

3. AST (Flammable/Combustible Liquid) Tank Installation: Provide signed record of Final Inspection issued by County Fire Department.

4. Waste Manifests: If a project will generate hazardous waste, the Contractor shall prepare waste manifests in accordance with HAR 11-262 and provide records to AIR-EE.

B. The Contractor shall comply with all applicable regulations and maintain records of permits, licenses, certificates, and other environmental regulatory requirement correspondence. Submit copies of permits, licenses, certifications, inspection reports, releases, notices, receipts for fee payments, correspondence, records, and similar documents, established for compliance with environmental regulations bearing on performance of the work.

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.01 AIR POLLUTION CONTROL

A. Emission: The Contractor shall not be allowed to operate equipment and vehicles that show excessive emissions of exhaust gases until corrective repairs or adjustments are made, as determined by the Engineer.

B. Dust: The Contractor, for the duration of the contract, shall maintain all excavations, embankments, haul roads, permanent access roads, plant sites, waste disposal areas, borrow areas, graded areas, staging and storage areas, and all other work areas within or outside the project limits free from dust that would cause a hazard or nuisance to the work or operations of other Contractors, or to persons or property. Industry-accepted methods, that meet requirements of DOTA Construction BMP Field Manual as noted in Specification 01561 and that meet stabilization suitable for the area or materials involved.

C. Burning on Airport property shall not be permitted.

3.02 SPILL CONTROL

A. The Contractor shall follow the DOTA Construction Site Runoff Program and relevant documents, such as the Construction BMP Field Manual to implement BMPs to prevent spills and leaks and report and cleanup spills and leaks immediately, as required.

3.03 DISPOSAL

A. All unusable debris and waste material shall be hauled away to an appropriate local landfill. Contractor shall control dust during loading operations.

B. Contractor shall consult with the landfill and conduct any required waste characterization to ensure that waste meets the landfill's requirements for size, type, etc.

C. No burying of debris or waste materials, except for materials that are specifically indicated elsewhere in these specifications as suitable for backfill, shall be permitted on the project site.

D. Contractor shall manage all construction materials, debris, and waste in a manner that prevents Foreign Object Debris (FOD) from reaching the airfield, where it could be an aircraft safety hazard.

3.04 HAZARDOUS MATERIALS CONTROL

Hazardous materials shall be properly stored and handled. The use of prohibited hazardous materials, e.g., asbestos, lead paint, and polychlorinated biphenyls (PCBs), in the construction of this project shall be strictly prohibited. Any corrective action to remove and replace hazardous material and contaminated work areas shall be at the sole expense of the Contractor.

3.05 OCCUPATIONAL HEALTH AND SAFETY

The Contractor shall at all times comply with all State of Hawaii and Federal rules and regulations related to occupational health and safety and develop and follow a Health and Safety Plan describing measures the Contractor will employ to protect the health and safety of their employees. Include measures required to protect the public from dangers associated with their work.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

All work specified in this Section shall not be measured nor paid for separately but shall be considered incidental to item 01561.1, Construction Site Pollution Controls.

END OF SECTION

SECTION 01561 – CONSTRUCTION SITE POLLUTION CONTROLS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 DESCRIPTION

A. This Section describes procedures for the proper application of management and engineering controls at State of Hawaii, Department of Transportation, Airports (DOTA) construction sites so that pollutants do not impact any storm drainage system, State water, soil, or groundwater.

B. The Contractor shall supply all labor, materials, and equipment necessary for the management of stormwater during construction and to carry out the work in accordance with these specifications, and all applicable Federal, State, and local regulations and latest amendments.

C. This Section also applies to construction support activities including concrete or asphalt batch plants, rock crushing plants, equipment staging yards/areas, material storage areas, excavated material disposal areas, borrow areas, waste management facilities, sanitary facilities, material storage areas, and temporary equipment fueling locations, regardless of their proximity to the Airport Property and 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.

D. The Contractor shall be responsible for all subcontractors, suppliers, and vendors, and shall ensure that the means and methods of construction activities of subcontractors, suppliers, and vendors are in full compliance with this Section.

E. The Contractor shall examine and be familiar with documents related to stormwater management at the airports and shall comply with related requirements for construction stormwater control. Should a requirement not be clearly described within the construction plans, specifications, permits and other applicable bid documents, notify the Engineer immediately for interpretation.

1.03 REFERENCES

All work shall conform to the most recent edition of the following, unless otherwise noted or specified on the drawings or in these specifications. Where conflicts among the requirements or with these specifications exists, the most stringent requirements shall apply.

A. DOTA Construction Site Runoff Control Program
http://hidot.hawaii.gov/airports/doing-business/engineering/environmental/construction-site-runoff-control-program

1. DOTA Construction Activities Best Management Practices (BMP) Field Manual.

2. DOTA Environmental Requirements for Construction Projects Standard Operating Procedures.

3. DOTA Stormwater Management Plans (SWMPs) for the Daniel K. Inouye International Airport (HNL) and Kahului Airport (OGG), as applicable.

4. DOTA Industrial SWPPPs for the HNL, OGG, and the Lihue Airport (LIH), as applicable.

B. State of Hawaii Administrative Rules, Title 11, Department of Health (DOH)
https://health.hawaii.gov/opppd/department-of-health-administrative-rules-title-11/

1. Chapter 54, Water Quality Standards

2. Chapter 55, Water Pollution Control

3. Chapter 451, State Contingency Plan

C. United States (U.S.) Code of Federal Regulations (CFR), Title 40, Chapter I: Environmental Protection Agency.

D. Hawaii Revised Statutes (HRS), Part I, Chapter 128D, “Environmental Response Law”.

PART 2 – PRODUCTS

2.01 MATERIALS

Comply with applicable materials described in the current DOTA Construction Activities BMP Field Manual. Refer to FAA Advisory Circulars and DOTA District Office, including Wildlife Hazard Management Plan, for additional guidance and conditions. In addition, materials shall comply with the following:

A. Grass: The FAA and USDA recommend the following grass species when requiring grass: "No-Mow" bermudagrass ("Green Velvet") (Cynodon dactylon) or Seashore paspalum (Paspalum vaginatum). These species possess higher than average drought resistance, saline soil tolerances, and most importantly, do not produce seed heads attractive to the majority of hazardous avian species. Use stolons, sprigs, or plugs to avoid providing hazardous species with a readily available food source. The use of seeds is generally not allowed. Alternative grass species shall only be applied with the approval by the Engineer after consultation with United States Department of Agriculture (USDA) airport representative. This includes, but is not limited to, sodding, cuttings, and planting. Grass shall be a quick-growing species. Grass shall be suitable to the area and provide a temporary cover that will not compete later with permanent cover.

B. Irrigation: Any required irrigation shall be done after dark to reduce instances of water becoming a hazardous wildlife attractant.

PART 3 – EXECUTION

3.01 PRE-CONSTRUCTION REQUIREMENTS

Do not begin construction activities until all submittals detailed in this Subsection are completed, submitted to the Engineer, and accepted in writing by AIR-EE.

A. Water Pollution, Dust, Sediment, and Erosion Control Meeting: Schedule a water pollution, dust, sediment, and erosion control meeting with the Engineer after all documents required by AIR-EE are submitted to the Engineer and accepted in writing by AIR-EE. The meeting shall be scheduled a minimum of 14 calendar days prior to the Start Work Date. At a minimum, the meeting shall be attended by the Contractor, subcontractors whose work may provide an impact to stormwater or site environmental conditions, Engineer, AIR-EE, and any authorized representatives of the designated attendees. The meeting will discuss the sequence of work and plans and proposals for water pollution, dust, sediment, and erosion controls.

B. Land Disturbance Calculations: The Contractor is responsible for calculating the total land disturbance for the life of the project and complying with all environmental requirements associated with the total land disturbance calculated. Disturbance of land is defined by Hawaii Department of Health as "the penetration, turning, or moving of soil or resurfacing of pavement with exposure of the base course or the exposure of bare soil or ground surface, including the land surface exposed by construction roads, baseyards, staging areas, demolition, headquarters, and parking areas. It does not include grass or weed cutting, bush or tree trimming or felling that leaves soil or ground intact. It includes 'grubbing' in its normal meaning of the use of equipment to knock down and push vegetation out of the way, typically uprooting vegetation and disturbing the ground surface." Land disturbing activities that shall be included in the disturbance area calculation shall follow the guidance provided in the Environmental Requirements for Construction Projects Standard Operating Procedures.

C. Site-Specific BMP (SSBMP) Plan or Stormwater Pollution Prevention Plan (SWPPP): The Contractor shall submit a SSBMP Plan (for projects disturbing less than one acre) or SWPPP (for projects disturbing one acre or more) using the latest DOTA template for acceptance by AIR-EE. If a SSBMP Plan or SWPPP was prepared by the Designer, the Contractor shall revise the plan using the latest template to include additional information required of the Contractor and any changes the Contractor proposes. The SSBMP Plan or SWPPP shall include site-specific temporary BMPs following requirements and practices outlined in DOTA's "Construction Activities BMP Field Manual." All AIR-EE comments shall be resolved and the SSBMP Plan or SWPPP approved prior to the start of land-disturbing activities, including those activities that are needed for the implementation of the BMPs. Submission of the complete and acceptable SSBMP Plan or SWPPP is the sole responsibility of the Contractor, and additional contract time will not be issued for delays due to incompleteness.

D. SSBMP Plan/SWPPP Modifications: Modify, as necessary, and resubmit amended SSBMP Plan or SWPPP and construction schedules to the Engineer for acceptance by AIR-EE. Amendments to the SSBMP Plan or SWPPP shall be made under the following circumstances at a minimum:

1. Conditions that develop during construction that were unforeseen during the design and pre-construction stages that could impact stormwater, soil, or groundwater.

2. Changes to the Contractor's Means and Methods of Construction that could impact stormwater, soil, or groundwater.

3. Omitted conditions that should have been allowed for in the accepted documents.

4. A SSBMP Plan measure that replaces an accepted SSBMP Plan measure that was not satisfactorily performing.

5. Revised dates of installation and/or removal of SSBMP Plan measures.

SSBMP Plan/SWPPP modifications shall be submitted to the Engineer and accepted in writing by AIR-EE before implementing the revised site-specific BMPs in the field. Amendments to the SSBMP Plan or SWPPP shall be included with the original SSBMP Plan or SWPPP and documented in the Amendment Log.

E. Documentation: A copy of the accepted original or amended SSBMP Plan or SWPPP, with the signed certification by the authorized representative filed with DOH for SWPPPs, shall be kept 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, AIR-EE, DOTA's designated authorized representative, and/or DOH/EPA Representative.

F. NPDES Construction Permit: If the total land disturbance for the life of the project, including all construction support activity areas, is one acre or more, coverage under an NPDES Permit Authorizing Discharges of Storm Water Associated with Construction Activity (NPDES Construction Permit) authorizing stormwater discharges associated with construction activity is required from the Department of Health, Clean Water Branch (CWB).

1. Do not begin land-disturbing activities until the CWB has issued an Individual NPDES Permit or NGPC. Conduct land-disturbing activities in accordance with the conditions of the NPDES Permit and/or NGPC.

2. The Contractor shall submit a Notification of Start to CWB a minimum of seven calendar days before the start of construction and provide AIR-EE with a record of submittal.

3. Before construction begins, the Contractor shall assign one of their personnel as the Duly Authorized Representative, in accordance with Section 15 of Appendix A, Chapter 1155. The Duly Authorized Representative is responsible for compliance with the NPDES Construction Permit (i.e., operations of the construction project) and shall certify, sign, and date various documents, including the SWPPP and SWPPP inspection documents.

G. Solid Waste Disclosure: Submit the Solid Waste Disclosure Form for Construction Sites, if applicable, to the DOH Solid Waste Branch as specified on the form within 7 calendar days before the start of construction activities and provide a copy to the Engineer. Provide a copy of all the disposal receipts from

the facility permitted by the Department of Health to receive solid waste to the Engineer. This shall also include documentation from any intermediary facility where solid waste is stored, handled or processed.

H. NPDES Hydrotesting Permit: If hydrotesting activities require effluent discharge into State waters or drainage systems, coverage under an NPDES Hydrotesting Waters Permit authorizing discharges associated with hydrotesting is required from the CWB. Do not begin hydrotesting activities until the CWB has issued an Individual NPDES Permit or NGPC for hydrotesting. Conduct Hydrotesting operations in accordance with the conditions of the NPDES Permit and/or NGPC.

I. NPDES Dewatering Permit: If dewatering activities require effluent discharge into State waters or drainage systems, coverage under an NPDES Dewatering Permit authorizing discharges associated with dewatering is required from the CWB. Do not begin dewatering activities until the CWB has issued an Individual NPDES Permit or NGPC for dewatering. Conduct dewatering operations in accordance with the conditions of the permit or NGPC.

J. Construction BMP Training: All Contractor's and subcontractor's employees on the project shall complete the DOTA Construction BMP Training prior to entering the construction site and every calendar year thereafter. All Contractor and subcontractor personnel involved with construction project responsibilities shall also be trained on the site-specific BMPs that are utilized during construction and spill response. Records of completion and/or training roster sign-in sheet shall be up to date and included in the SWPPP or SSBMP Plan. Additional training required by AIR-EE shall be at no additional time or cost to the project. There are two training options:

1. All Contractor and subcontractor employees involved with construction project responsibilities watch the DOTA Construction BMP Training Video located on the DOTA Construction Site Runoff Control Program webpage and complete the DOTA Construction BMP Training Survey with a passing score, or

2. The Contractor and subcontractor supervisors/managers watch the DOTA Construction BMP Training Video located on the DOTA Construction Site Runoff Control Program webpage, complete the DOTA Construction BMP Training Survey with a passing score, then train all employees involved with construction project responsibilities and submit a sign-in roster documenting all employees trained at the bottom of the DOTA Construction BMP Training Survey.

   DOTA Construction BMP Training Survey:
   https://hidot.hawaii.gov/airports/doing-business/engineering/environmental/construction-bmp-training-survey/

K. Construction Connection, Discharge, and Surface Runoff Permit: The Contractor shall complete the Contractor's section of the Construction Connection, Discharge, and Surface Runoff Permit and submit to AIR-EE for review. All AIR-EE comments shall be resolved prior to the start of land-disturbing activities.

3.02 CONSTRUCTION REQUIREMENTS

A. Construction Start: Do not expose or disturb surface area of earth material or initiate any land-disturbing activities until submittals detailed in Subsection 01561.3.01 – Pre-construction Requirements are completed, submitted to the Engineer and accepted in writing by AIR-EE. Once installation of BMPs is allowed, a Pre-construction BMP Inspection is conducted, and all deficiencies that are noted during the inspection shall be corrected prior to any other ground disturbance.

B. BMP Installation and Maintenance: Provide, install, maintain, monitor, repair and replace BMPs as needed to maintain efficacy. Address all inspection comments received from the Engineer, AIR-EE, and/or DOTA's designated authorized representative.

C. Protect temporarily or permanently disturbed soil surface from rainfall impact, runoff, and wind before the end of each work day. Coordinate and schedule the work to the maximum extent possible to minimize the amount of exposed or disturbed surface area of earth material.

D. Install and maintain stabilized construction entrances/exits, including any wheel washes, to minimize tracking of dirt and mud onto roadways, sidewalks, and other paved areas. Restrict traffic to stabilized construction entrance 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. If tracking is excessive or sediment is being transported farther along the pavement or sidewalk by other vehicles traveling outside of the construction site, conduct cleaning and sweeping immediately. Modify stabilized construction entrances/exits, as needed, to prevent mud from being tracked onto road. Stabilize entire access roads if necessary.

E. Maintain all excavations, embankments, haul roads, permanent access roads, plant sites, waste disposal areas, borrow areas, and all other work areas within the project limits free from dust that would cause a hazard to the work, airport operations, operations of other contractors, or to persons or property. If chemicals are used as soil stabilizers for erosion and dust control, submit the manufacturer's product data sheets of the chemicals to the Project Manager for acceptance by AIR-EE. Oil treating shall not be used. Dust screens and fabrics are not allowed to be mounted on, or to inhibit the view of, the TSA and AOA Security Fences.

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

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

1. Hydromulching cuts and fills that may erode.

2. Installing check dams or other silt control devices.

3. Other methods acceptable to AIR-EE.

H. Clean up and remove any pollutant that is attributed to the Contractor. Care shall be taken to ensure that no petroleum/chemical products, bituminous materials, or other deleterious substances, including debris, are allowed to fall, flow, leach, or otherwise enter the sewage systems or storm drains. Deposition of solid waste or the discharge of liquid waste, such as fuels, lubricants, bituminous waste, untreated sewage and other pollutants that may contaminate stormwater, surface waters, soil, or groundwater shall not be permitted.

I. Disturbed Area Stabilization: Immediately initiate stabilization of exposed soil areas upon completion of land-disturbing activities for areas where disturbance has permanently or temporarily ceased on any portion of the site. Land-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. Land-disturbing activities have temporarily ceased when clearing, grading, or excavation within any area of the site 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 land-disturbing activities have temporarily or permanently ceased.

1. After the initiation of stabilization, stabilization activities shall be completed according to the following timeline:

a. For projects with an NPDES Construction Permit:

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

- For construction areas discharging into nutrient or sediment impaired waters, complete installation of stabilization measures within 7 calendar days after the temporary or permanent cessation of land-disturbing activities.

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

J. Notice of Cessation: For projects with an NPDES Construction Permit, the Contractor shall submit a Notice of Cessation to CWB within seven calendar days after the end of the month that the project was completed and provide AIR-EE with a record of submittal.

K. Changes to Land-disturbing Activities: The Contractor shall be responsible to prepare a new SWPPP or SSBMP Plans or amend existing SWPPP or SSBMP Plans if changes to the project or to the Contractor's activities result in land-disturbing activities additional to those previously approved:

1. Land-disturbing activity outside of the approved limits is NOT allowed until approval and proper permits are received. Revised documents, including an updated SWPPP or SSBMP Plan, shall be submitted to and approved by AIR-EE prior to conducting additional land-disturbing activities.

2. If coverage under an NPDES Construction Permit is needed, no activity in the additional area may occur until the additional permit coverage is granted:

a. If the project was already granted coverage under an NPDES Construction Permit, additional coverage shall be obtained from CWB for the additional area, either by adding the area to existing project documents, and applying for NPDES Construction Permit coverage for the entire project OR by creating new documents and obtaining separate NPDES Construction Permit coverage for the additional area.

b. If the new disturbed area will result in the total disturbed area equaling one (1.0) acre or more for a project without existing NPDES Construction Permit coverage, NPDES Construction Permit coverage shall be obtained from CWB that will cover all land-disturbing activities anticipated for the life of the project.

3.03 INSPECTIONS

Refer to the DOTA Construction Site Runoff Program for information pertaining to AIR-EE BMP inspections (pre-construction, routine, and final). Contractor self-inspections shall occur based on the frequency outlined in the SSBMP Plan and, if applicable, NPDES Permit (HAR 11-55) and SWPPP requirements.

A. Corrective Actions: The Contractor shall be responsible for the correction of all deficiencies identified during any of the above inspections.

1. If the Contractor fails to satisfactorily address inspection deficiencies, the DOTA reserves the right to employ outside assistance or use the State's own labor forces to provide necessary corrective measures. The Contractor will be fully responsible for all related cost and time. The State will charge the Contractor such incurred costs plus any associated project engineering costs and will make appropriate deductions from the Contractor's progress payment. Additionally, DOTA can issue liquidated damages for deficiencies not resolved to DOTA's satisfaction and for illicit discharges or contaminant discharges to soil, groundwater, surface water, or State waters (see Appendix A).

2. Failure to install or maintain site-specific BMP measures may result in the assessment of liquidated damages (Appendix A). Depending on the severity of the deficiencies, additional enforcement actions, such as suspension of work and/or termination of the contract (with the Contractor's Surety being fully responsible for all additional costs incurred by the State), can be conducted and assessed against the Contractor.

3. For all citations or fines received by the DOTA for non-compliance, including non-compliance with NPDES Permit conditions, the Contractor shall reimburse the State within 30 calendar days for the full amount of outstanding cost that the State has incurred. The State may deduct incurred costs from the Contractor's progress payments; however, the Contractor shall be responsible for reimbursing the State if the costs exceed remaining payments owed to the Contractor.

4. The Contractor shall be responsible for all citations, fines and penalties levied by DOH or EPA against the State due to the Contractor's failure to satisfactorily address site-specific BMP deficiencies and/or any Contractor's illicit discharges. The State may make the appropriate deductions from the Contractor's progress payment.; however, the Contractor shall be responsible for reimbursing the State if the costs of correction exceed remaining payments owed to the Contractor.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work under this Section will be paid for under the various contract items shown below. For ALLOWANCE items in the proposal schedule, the allowance is an estimate, and the amount shall not exceed the maximum amount shown in the Proposal Schedule. The Contractor shall provide an estimated cost for Construction Site Runoff Control for each proposal under the Contract. Payment shall be the actual cost as invoiced by the Contractor and approved by the DOTA Engineer. The Contractor shall be allowed to include overhead, profit, insurance and/or other markups, as stipulated in Section 9.5 of the General Provisions for Construction Projects, Air and Water Transportation Facilities Division.

Item No.	Item	Unit
01561.1	Construction Site Pollution Controls	Allowance

Partial payments shall be paid in the Monthly Progress Payment as follows:

A. 20% of the line item price shall be paid upon the satisfactory completion of the Pre-construction BMP Inspection and associated corrective actions accepted by AIR-EE or their designated authorized representative, as described in Section 01561.3.03(A), above.

B. 70% of the line item price shall be paid in equal monthly payments over the duration of the contract. Failure to satisfactorily apply, maintain, or modify BMP measures and devices, and/or submittals shall result in the withholding of monthly progress payments for this line item.

For projects that will disturb one acre or more of land, or will be part of a larger common plan of development that will disturb one acre or more of land, payments shall be made only after Routine BMP Inspections described in Section 01561.3.03 above have been satisfactorily completed, and associated corrective actions accepted by AIR-EE or their designated authorized representative.

C. The remaining 10% of the line item price shall be paid after all temporary BMP measures have been satisfactorily removed. Payment will be made only after the satisfactory completion of the Final BMP Inspection and associated corrective actions accepted by AIR-EE or their designated authorized representative, and acceptance of the Post-construction BMPs by AIR-EE or their designated authorized representative.

Liquidated Damages, up to $25,000 per day (Appendix A), shall be assessed for each non-compliance of the BMP requirements described in this Section. The Contractor shall not be entitled to recover any Liquidated Damages assessed, even after the deficiencies have been corrected.

The Liquidated Damages cited in Appendix A are in excess of reimbursement for any citations, fines, or penalties levied by any regulatory agency against the State due to the Contractor's violations of clean water regulations or standards.

Appendix A. Liquidated Damages Schedule for Non-Compliances

Non-Compliance	Amount
Failure to obtain coverage under an NPDES Construction Permit for construction activities associated with a project that will disturb one acre or more of land, or will be part of a larger common plan of development that will disturb one acre or more of land, as defined by DOH.	$1,000 per calendar day per violation.
Failure to obtain coverage under an NPDES Hydrotesting Permit for hydrotesting activities that will require effluent discharge into State waters or drainage systems.	$1,000 per calendar day per violation.
Failure to obtain coverage under an NPDES Dewatering Permit for dewatering activities that will require effluent discharge into State waters or drainage systems.	$1,000 per calendar day per violation.
Failure to comply with the conditions specified in an NPDES Permit, or any other applicable permit.	$1,000 per calendar day per violation.
Failure to schedule a Pre-construction BMP Inspection and receive acceptance of all associated corrective actions prior to conducting land-disturbing activities.	$1,000 per calendar day per violation.
Failure to provide corrective actions accepted by AIR-EE or their designated authorized representative by the deadlines identified in the BMP inspection report.	$1,000 per calendar day per violation.
Failure to have the accepted SSBMP Plan and amendments or the accepted SWPPP and amendments available at a project construction site.	$1,000 per calendar day per violation.
Failure to properly install or maintain a BMP specified by the SSBMP Plan, SWPPP, contract drawings and documents, or permit.	$2,000 per calendar day per violation.

Non-Compliance	Amount
Failure to have an accepted amendment to the SSBMP Plan or an accepted amendment to the SWPPP prior to implementing changes to previously accepted BMPs. Note: Advance review and acceptance can be provided to satisfy this non-compliance. However, for projects with an NGPC or NPDES permit, the written amendment shall still be formally submitted for certification and signature by the authorized representative identified in the NGPC or NDPES Permit.	$2,000 per calendar day per violation.
Failure to conduct required inspections.	$1,000 for each of the first ten violations, $2,500 for each of the next ten violations, $5,000 for each subsequent violation.
Failure to maintain required records such as BMP inspection reports, rain gauge data logs, etc.	$500 per calendar day for the first ten days of each violation, $1,000 per calendar day for the next ten days of each violation, $2,500 per calendar day for each subsequent day of violation.
Any violation resulting in a polluted discharge.	Up to $25,000 per calendar day per violation.
Note: Liquidated Damages shown in the Table shall be assessed at the discretion of the DOTA.	

Assessment of Liquidated Damages for Non-Compliance:

The Contractor may be assessed liquidated damages by issuance of an Enforcement Letter. The Enforcement Letter shall indicate the amount of liquidated damages that are assessed for the non-compliances which shall be deducted from the Contractor's next progress payment. The Enforcement Letter will be sent electronically via e-mail and a hard copy to the Contractor's designated representative(s), identified in Section 01561.3.01(2)(d), responsible for the Contractor's Construction Site Runoff Control Program. An Enforcement Letter may be issued with or without previous verbal notifications, written warnings, or official enforcement letters (i.e. Warning Letter or Notice of Violation (NOV).

Liquidated Damages may be assessed for the following:

- Non-compliances listed in the Table, herein, included in Appendix A.
- Non-compliances have not been corrected in the timeframes noted.
- Corrective actions are not completed after a verbal notification, written warning (email or formal letter), or NOV is issued.
- Contractors are non-responsive to DOTA's directives.
- Repeated non-compliance.
- A polluted discharge has occurred.

The number of days used for the liquidated damages calculations shall start on the day that the non-compliance was required to be corrected and shall end on the day that the non-compliance is corrected and accepted. If DOTA's personnel are not able to go out in the field to verify that the BMP deficiencies are corrected in the timeframe specified, the Contractor can send photographs showing the corrected deficiency via e-mail to the DOTA Engineer and AIR-EE along with documentation on how the deficiency was corrected. The DOTA Engineer and AIR-EE may visit the site to verify the corrective actions are acceptable. If the corrective actions are acceptable, then the clock stops on the day that the documentation was received.

The Contractor shall not be entitled for compensation for any liquidated damages or penalty, fine, or citations assessed and deducted from the Contractor's progress payments, even after corrective actions have been taken.

END OF SECTION

SECTION 01562 – MANAGEMENT OF CONTAMINATED MEDIA, SOIL DISPOSAL, AND SOIL REUSE

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

The General Provisions for Construction Projects (2016), Special Provisions and General Requirements of the Specifications, apply to the work specified in this Section.

1.02 DESCRIPTION

A. This Section describes procedures for the management of known and/or unknown contaminated media (e.g., soil, sediment, groundwater, soil vapor, and building materials) and disposal and on-site reuse of either contaminated or uncontaminated soil/sediment (referred to herein as "soil"), that may be disturbed or generated during excavation or demolition activities, or other construction activities associated with this project.

B. All soil shall be treated as potentially contaminated until it is determined otherwise.

C. The Contractor shall supply all labor, materials, and equipment necessary for the removal, temporary storage, testing, handling, backfilling and management of soil and contaminated media to carry out the work in accordance with these specifications, and all applicable Federal, State, and local regulations and latest amendments.

D. The Contractor shall follow the State of Hawaii, Department of Transportation, Airports (DOTA) Programmatic Environmental Hazard Evaluation and Environmental Hazard Management Plan (DOTA EHE-EHMP). References to the Site-specific Construction-Environmental Hazard Management Plan (C-EHMP) and C-EHMP Addendum do not apply, unless contamination is identified during construction that warrants additional plans, if directed by DOH.

E. Qualified Environmental Professional: The Contractor shall employ a Qualified Environmental Professional (QEP) who possesses a minimum of five (5) years of experience providing environmental oversight for the management of contaminated media during construction activities, who shall assist with sampling, testing, and creating plans including the preparation of the Contractor's C-EHMP (Site-Specific or Addendum). The QEP shall be identified in the applicable C-EHMP document.

F. The Contractor and their QEP shall review any site-specific investigation reports (e.g., Phase II Environmental Site Assessment [ESA]) or construction management plans, etc.) to understand the conditions that may affect work performance.

G. Should the Contractor deviate from the DOTA EHE-EHMP, C-EHMP Addendum, or Site-Specific EHMP, the Contractor shall be responsible to prepare or modify any existing Hawaii Department of Health (DOH) required C-EHMP (Site-specific or Addendum). Any deviation from construction EHMPs will require approval by DOH and the DOTA Engineering Branch, Environmental Section (AIR-EE) prior to implementation. The Contractor shall detail deviations from standard practices and explain how those deviations will be protective of human health and the environment.

H. The primary contaminant-related hazards addressed by the DOTA EHE-EHMP or a C-EHMP include, but are not limited to, the following Contaminants of Potential Concern (COPCs):

1. Petroleum-related Hydrocarbons, e.g., TPH-g, TPH-d, TPH-o, BTEX, and PAHs
2. Constituents of light distillate fuels and/or Chlorinated Solvents (together considered volatile organic compounds or VOCs)
3. Polychlorinated Biphenyls (PCBs)
4. Pesticides, e.g., Chlordane, Dieldrin
5. Metals, e.g., Arsenic, Barium, Cadmium, Total Chromium, Lead, Mercury, Selenium, and Silver
6. Per- and Polyfluoroalkyl Substances (PFAS)

In addition, free petroleum product (e.g., gasoline, aviation gasoline, diesel fuel, jet fuel, motor oils, lubricating oils) may be encountered in soil or groundwater in areas of previous petroleum releases.

Soil vapor may be present from volatile COPCs present in subsurface soil or groundwater.

Should changes in site conditions or additional site information identify contaminants or risks to human health and/or the environment not addressed by the DOTA EHE-EHMP or C-EHMP (Site-Specific or Addendum), the Contractor shall be responsible to revise, update, and finalize a C-EHMP (Site-Specific or Addendum), to be reviewed and approved by AIR-EE and the DOH Hazard Evaluation and Emergency Response (HEER) Office.

The Contractor shall coordinate with AIR-EE, as well as have any C-EHMP (Site-Specific or Addendum) approved by the HEER Office, prior to the start or continuation (in the case of an Addendum) of any related ground disturbing activities.

1.03 REFERENCES

All work shall conform to the latest edition of the following, unless otherwise noted or specified on the drawings or in these specifications. Where conflicts among the requirements or with these specifications exists, the most stringent requirements shall apply.

A. DOTA Construction Site Runoff Control Program https://hidot.hawaii.gov/airports/doing-business/engineering/environmental/construction-site-runoff-control-program/

1. DOTA EHE-EHMP

2. DOTA Construction Best Management Practices (BMP) Manual

B. Department of Health (DOH) Hazard Evaluation & Emergency Response (DOH HEER) https://health.hawaii.gov/heer/

1. Technical Guidance Manual (TGM) for Implementation of the State Contingency Plan (including updates).

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

3. HEER Office Screening for Environmental Hazards at Sites with Contaminated Soil and Groundwater.

4. HEER Office Construction EHMP and EHMP Addendum Template.

C. State of Hawaii Administrative Rules, Title 11, DOH https://health.hawaii.gov/opppd/department-of-health-administrative-rules-title-11/

1. Chapter 54 Water Quality Standards

2. Chapter 58.1 Solid Waste Management Control

3. Chapter 59 Ambient Air Quality Standards

4. Chapter 11-260.1-279.1 Hazardous Waste Management: General Provisions

5. Chapter 280.1 Underground Storage Tanks

6. Chapter 451 State Contingency Plan

D. The Hawaii Environmental Response Law (Hawaii Revised Statutes [HRS] Chapter 128D) and the State Contingency Plan (Hawaii Administrative Rules [HAR] Title 11, Chapters 451-1–451-24).

E. American Petroleum Institute (API) RP 2219
https://www.api.org/oil-and-natural-gas/health-and-safety/refinery-and-plant-safety/occupational-safety/rp-2219

F. United States Code of Federal Regulations (CFR), Title 29: Labor
https://www.ecfr.gov/current/title-29

G. CFR, Title 40: Protection of the Environment
https://www.ecfr.gov/current/title-40

1. Part 50, "National Primary and Secondary Ambient Air Quality Standards A".

2. Part 122, "EPA Administered Permit Program: The National Pollutant Discharge Elimination System".

3. Part 261, "Identification and Listing of Hazardous Waste".

4. Part 263, "Standards Applicable to Transporters of Hazardous Waste".

5. Part 302, "Designation, Reportable Quantities, and Notification".

H. CFR, Title 49: Transportation
https://www.ecfr.gov/current/title-49

1. Part 171, "General Information, Regulations, and Definitions".

2. Part 172, "Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, Training Requirements, and Security Plans".

I. U.S. EPA Comprehensive Environmental Restoration, Compensation, and Liability Act (CERCLA), Section 107(1), exemption for cleanup of legally applied pesticide products.
https://www.epa.gov/enforcement/superfund-enforcement-authorities

PART 2 – PRODUCTS (Not Used)

PART 3 – EXECUTION

3.01 GENERAL WORK PROCEDURES

A. Prior to beginning work, the Contractor, the Contractor's QEP, and the Engineer or their representative shall review and discuss all available information pertaining to contamination or potential contamination at the work site.

B. It should be noted that, in some cases, the contamination (e.g., soil or groundwater contaminated with metals, PCBs, pesticides, PFAS, etc.) may not be identifiable through visual and/or olfactory observation, and contaminant-specific field screening techniques may need to be implemented.

C. Potential or suspected contaminated media from separate locations or sources shall not be mixed or placed together without the approval of the Qualified Environmental Professional and AIR-EE.

D. The removal, transfer, or handling of explosive or flammable media shall be conducted using explosion-proof pumps and equipment. If a vacuum truck is used for removal of liquids or residues, the area of operation for the vacuum truck shall be vapor free. Discharge the vacuum pump exhaust gases through a hose of adequate size and length downwind of the truck and tank area. Vacuum truck operating and safety practices shall conform to API RP 2219. Collect tank residues in drums, tanks, or tank trucks labeled according to 49 CFR 171 and 49 CFR 172 and dispose of as required by regulation.

E. Contractor shall follow decontamination regulations and procedures as necessary.

F. Soil excavation, grading, and any disturbance of contaminated soil may cause a potential exposure to Contractor's employees and the public from the release of vapors or fugitive dust. The routes of exposure to dusts are by inhalation, ingestion, and dermal contact. The Contractor shall use engineering controls such as a cover, water spraying, and/or wind barriers to control fugitive dust to mitigate the release of and exposure to soil vapors.

G. The Contractor's QEP shall test excavated soil for the presence of COPCs and oversee excavated soil management in accordance with this Section and relevant guidance and regulations.

H. Contractor shall report construction activities in areas with contaminated soil or groundwater in accordance with an applicable C-EHMP or the DOTA EHE-EHMP. Contractor shall coordinate with the DOH HEER Office, the Engineer, and AIR-EE.

I. All Contractor correspondence with DOH and other regulatory agencies shall include the Engineer and AIR-EE.

3.02 PRECONSTRUCTION REQUIREMENTS

A. Submit the following a minimum of 30 calendar days prior to beginning any ground disturbing activities, for approval by AIR-EE.

1. The Contractor's revisions to the C-EHMP Addendum or Site-Specific C-EHMP completed in the design phase, or creation of a C-EHMP addendum if deviating from the DOTA EHE-EHMP, that includes, but is not limited to:

a. Procedures, engineering controls, and methods the Contractor will use during the excavation, soil stockpiling and segregation, temporary storage, testing, handling, treatment, backfilling, and disposal of contaminated media, work area isolation, construction barriers, dust control, decontamination, and emergency management.

b. Names of the Contractor's and their subcontractor's qualified personnel who will be supervising or managing contaminated materials at the site. Include the personnel's phone number and qualifications.

c. Name(s) of the Contractor's Qualified Environmental Professional, including their qualifications.

d. Proposed schedule of work.

e. Location map of temporary contaminated stockpiles and other contaminated media storage, including infrastructure such as pipes and appurtenances, if applicable.

f. All documents required as part of the appendices to the DOTA EHE-EHMP (e.g., health and safety plan and completing the management plans in the appendices) or C-EHMP (Site-Specific or Addendum) applicable appendices (e.g., health and safety plan, construction material documents, etc.).

3.03 CONSTRUCTION REQUIREMENTS

A. Soil Excavation and Stockpiling:

1. Notify the DOH HEER Office at least 90 calendar days prior to disturbing contaminated soil at "HEER Sites" utilizing the HI DOH e-Permitting System - Notification of Construction Activities (HEER Office). Version 1.6 (hawaii.gov) or most recent version available. Obtain AIR-EE's review and concurrence prior to submittal to DOH.

2. The disturbance of contaminated media shall be performed in accordance with the DOTA EHE-EHMP or the Contractor's approved C-EHMP (Site-Specific or Addendum), where applicable. The HEER Office and AIR-EE shall be immediately notified if contaminated media not previously known or anticipated is encountered. The HEER Office will determine whether additional sampling is required. The Contractor shall provide a location map with Global Positioning System (GPS) coordinates and approximate depth below ground surface at which contaminated media were encountered to the Engineer and AIR-EE.

3. Soil stockpiles shall be created and managed in accordance with project plans, the approved project-specific C-EHMP (if applicable), and the DOH Guidance for Soil Stockpile Characterization and Evaluation of Imported and Exported Fill Material. If deviating from a DOH-approved C-EHMP, approval from DOTA and DOH is required. Contractor shall secure approval of new or revised stockpile characterization plans from DOTA prior to implementation. Soils placed in watertight containers shall be covered with plastic sheeting or positioned under a roof when not in active use. Soil stockpiles and containers shall be located at least 50 feet from drainage features, surface waters, and stormwater drainage paths.

4. Any liquid-phase oil or free product associated with the contaminated soil shall be drained prior to stockpiling. If feasible, the free product shall be separated from the soil, properly stored, profiled, and disposed of at an approved recycling or disposal facility.

B. Soil Testing and Disposal:

The Contractor shall test all soil generated during excavation, demolition, or other construction activities. Sampling and testing of stockpiles shall be, at a minimum, in accordance with the latest edition of the DOH's Guidance for Soil Stockpile Characterization and Evaluation of Imported and Exported Fill Material. The Contractor's QEP shall direct the soil sample collection and testing methods in accordance with the most current guidelines. All soil intended for disposal or reuse shall be tested for the presence of applicable COPCs as established by the QEP and as approved by AIR-EE.

Stockpiles shall be tested using multi-increment (MI) sampling methodology in accordance with the TGM. Alternative sampling approaches, and appropriate decision unit (DU) volumes for large volume soil stockpiles, should be discussed with AIR-EE and may be utilized on a case-by-case basis when approved by the HEER Office.

No soil from airport property shall be reused at private-owner off-site properties, even if the soil appears acceptable for unrestricted use based on testing conducted. Exceptions to this policy may only occur with the written approval of the

Engineer and AIR-EE. Disposal or reuse of soil at a residential property or where there are sensitive receptors (i.e. schools, recreational areas, etc.) will not be allowed under any circumstance.

For the purposes of this Section "off-site" is defined as any location outside of the established project construction boundary from which excavated soil was generated. There are two off-site soil disposal/reuse categories applicable to this Section: (1) Off-site within the Airport Boundary, and (2) Off-site and outside of the DOTA Airport Property. "On-site" refers to within the construction project boundary from which excavated soil was generated.

1. For off-site soil reuse within the airport boundary:

    a. The Contractor shall secure approval from the Engineer and AIR-EE for transport to the reuse location(s) prior to moving the soil.

    b. Soil shall not be categorized as or contain a regulated hazardous waste.

    c. Soil shall not exceed the DOH Tier 1 Environmental Action Levels (EALs) for unrestricted use.

2. For off-site soil disposal/reuse outside the airport property boundary:

    a. The Contractor shall confirm and comply with the disposal/receiving facility's testing requirements, as well as their standards for disposal/reuse.

    b. Soil that is a regulated hazardous waste shall be disposed at an approved United States Environmental Protection Agency (EPA) regulated facility.

    c. Soil that is above the DOH Tier 1 EALs for commercial/industrial use but not a regulated hazardous waste shall be disposed of at a DOH or EPA permitted disposal facility (i.e., landfill).

    d. Soil that is below the Hawaii Department of Health (DOH) Tier 1 Environmental Action Levels (EAL) for unrestricted use may be reused at an appropriate location as approved by the Engineer and AIR-EE.

e. For any contaminated media removed from Airport property to an approved facility, the Contractor shall be responsible for its legal transport and disposal. Contractor shall provide to the Engineer copies of any soil disposal receipts.

3. For on-site soil reuse:

a. The Contractor shall representatively test all soils designated for on-site reuse. Testing can occur either *in situ* prior to excavation or after excavation. Soil that does not exceed applicable DOH Tier 1 Environmental Action Levels (EAL) for unrestricted use may be reused on-site (within construction site boundaries) with AIR-EE approval.

b. Soil with contaminants that exceed DOH Tier 1 EALs may be approved for on-site (within construction site boundaries) reuse with written approval from AIR-EE and when the following conditions are met:

i. Contaminated soil is reused within other contaminated areas in the proximity of its original location and for which a long term EHE-EHMP has been established and (if necessary) can be readily modified to accommodate that change in site conditions.

ii. Contaminated soil is reused no less than 150 meters from the nearest surface water or surface water inlet.

iii. Contaminated soil is reused at an elevation above the tidally influenced high water table, and at least one foot below the finish surface grade, with the most contaminated soil placed at the bottom of the excavation and cleanest soil toward the ground surface. A minimum of one foot of clean soil shall comprise the final, top backfill layer and, unless waived by DOTA and DOH, an impervious layer shall cap this top layer.

iv. Contaminated soil is not reused within or beneath the footprint of a permanent building structure.

v. Contaminated soil to be reused cannot contain free oil, oil sheens, oil stains, or total petroleum hydrocarbons (TPH) concentrations exceeding 5,000 milligrams per kilogram (mg/kg).

C. Groundwater Management: Groundwater may be contaminated by petroleum hydrocarbons, dissolved metals, PFAS, VOCs, and/or pesticides, and may be encountered during soil excavation or dewatering activities.

1. If contaminated groundwater is discovered at a previously unknown source or site on the project, the Contractor shall immediately notify the Engineer, AIR-EE, and HEER Office. Provide a location map with GPS coordinates and approximate mean sea level depth of the groundwater at which the contamination was encountered.

2. The disturbance of contaminated groundwater shall be performed in accordance with the DOTA EHE-EHMP, or C-EHMP (Site-Specific or Addendum), where applicable. The HEER Office will determine whether additional sampling is required.

3. If free product is present in the extracted groundwater, it shall be separated from the groundwater, profiled, and disposed of at an DOH-approved recycling/disposal facility. Free product shall not be moved from one excavation to another. Engineering measures shall be taken to prevent the transfer of the free product during dewatering. Water contaminated with free product shall not be discharged from a dewatering pit.

4. Releases of contaminated groundwater to surface water bodies or areas beyond the work area is prohibited.

5. Groundwater shall only be re-infiltrated in the ground with the prior approval of AIR-EE and the HEER Office. Under circumstances where contaminated groundwater cannot be re-infiltrated, proper disposal at a licensed facility shall be conducted. Notification to the appropriate agencies and other pertinent information related to the discharge shall be conducted by copying the Engineer and AIR-EE on all correspondence and copies of correspondence provided upon request.

6. The Contractor is responsible for the legal disposal or discharge of groundwater that is not re-infiltrated and shall provide AIR-EE with copies of waste manifests.

7. For groundwater containerized and removed from Airport property, the Contractor shall have representative samples taken and tested in accordance with DOH guidelines, standards, and regulations. A copy of the groundwater test results shall be submitted to AIR-EE. The groundwater shall not be disposed off-site without the approval of the Engineer and a written approval from the DOH-permitted facility receiving the groundwater indicating that they acknowledge the groundwater test results and providing their approval to dispose the groundwater at their facility. Transport off-site shall occur in DOT-

approved containers or mobile tanks. Documentation for the removal of containerized groundwater is required in the Close-Out Report detailed in Section 3.04.

8. With approval from AIR-EE and oversight from the QEP, small volumes of groundwater may be disposed via evaporation from a constructed (lined) pond or basin, with solid residuals properly tested and disposed in accordance with this specification.

9. Release Reporting: Encountering previously unknown contaminated soil or groundwater during subsurface construction activities is considered a release and shall be reported to the HEER Office. Copies of the DOH Release Report, DOH-issued Release Number, and email correspondence (if applicable), shall be furnished to the Engineer and AIR-EE. The Contractor shall be responsible for release reporting and AIR-EE shall be included on all correspondence with the HEER office.

10. Report all leaks and spills immediately to AIR-EE, DOTA personnel, and regulatory agencies in accordance with the airport-specific DOTA Spill Reporting Fact Sheet available via the DOTA Construction Site Runoff Control Program Webpage at https://hidot.hawaii.gov/airports/doing-business/engineering/environmental/construction-site-runoff-control-program/.

    Releases that occur during construction activities or releases due to unforeseen events (spills) shall be reported immediately.

D. Underground Storage Tanks (USTs) and Utility Pipes:

1. For any UST or pipeline, whether unexpectedly discovered or a planned removal, the nature of the UST or pipeline and whether they are inactive shall be determined prior to removal. Immediately notify the Engineer, AIR-EE and HEER Office of any unexpected encounter with a UST or buried piping.

2. The Contractor shall record field observations of the UST and pipelines. These observations shall include, but are not limited to, the following:

    a. Location relative to fixed landmarks, including GPS coordinates. Provide a location map that shows the UST and pipelines that were encountered. The map shall include a North arrow and a scale.

    b. Depth, diameter, length, and type of piping. Describe the condition of the pipe.

c. Volume and type of fuel or product, including analytical laboratory reports for the product recovered.

d. Beginning and ending fluid levels, if applicable.

e. Flow rates, if applicable.

f. Direction of flow.

g. Detailed photographs.

h. Detailed description of actions taken following the discovery, such as cutting, product removal, and disposal.

3. Provide records of the field observations to the Engineer, AIR-EE, and HEER Office.

4. The removal of all USTs must comply with HAR § 11-280.1, and all correspondence related to identification, removal, and documentation shall be provided to the Engineer and AIR-EE. Only personnel knowledgeable and trained in pipeline and UST removal shall cut, drain, and remove USTs and pipelines. Hazardous conditions, particularly those created by explosive vapors and releases of product to the environment, shall be mitigated prior to removal activities. If any waste pipe or UST components are to be stored on-site prior to disposal, the area shall be lined with polyethylene plastic sheeting, 20 mil or thicker, and bermed to contain any free product. Provisions shall be in place to contain viscous products that may liquify after exposure to atmospheric heating. The waste pipe segments shall be drained of any residual product and stored on appropriate dunnage with the ends of the pipe sealed or covered to protect the interior of the pipe from contact with rainwater and wind.

5. All removed pipelines and USTs shall be properly disposed or recycled.

6. The Contractor shall prepare and submit a UST Removal Report, including the results of all sampling activities required under HAR § 11-280.1, to the Engineer, AIR-EE, and the DOH SHWB (UST Program).

3.04 POST-CONSTRUCTION REQUIREMENTS

A. Submit a Project Close-out Report within 30 calendar days after work is completed. The Close-out Report shall contain the following applicable contents:

1. A signed letter certifying that the removal and disposal of all contaminated materials were completed in accordance with the DOTA EHE-EHMP or Contractor's approved C-EHMP (Site-Specific or Addendum), and all applicable Federal, State, and local rules and regulations.

2. All approved DOTA EHE-EHMP deviation request forms. (Reference DOTA EHE-EHMP.)

3. Any Site-Specific EHMP(s) or Long-term EHMP(s). For locations at an airport for which DOTA has already established a Site-Specific EHMP from previous projects, the DOTA's Site-Specific EHMP shall remain applicable. Contractor shall assist DOTA by providing requested project data and records necessary to draft any required amendments resulting from a change in site conditions due to construction.

4. All testing and laboratory results, including chain of custody, for any soil/sediment, groundwater, soil vapor, or other media sampling and analysis.

5. Any results from air monitoring.

6. Record of Field Observations, including location map with GPS coordinates, limits, and depths of any contaminated media (soil, groundwater, etc.) that were encountered at previously unknown source or sites on the project. Include a copy of the completed Hawaii Hazardous Substance Written Follow-up Notification form that was submitted to DOH and all other associated documents.

7. If contaminated soil was disposed off-site (off Airport Property), include the following:

    a. A copy of the signed agreement from the receiving facility acknowledging the sample test results and indicating soil acceptance.
    b. Documentation of the quantity of soil received by the facility.

    c. Copies of the test results of the soil sampling.

    d. All certifications, disposal forms, waste manifests, and summary logs.

8. If any soil was approved for reuse on-site (within the construction site boundaries) or off-site within Airport Property, at a minimum, include the following:

   a. Copies of the test results of the soil sampling.

   b. The quantity of soil that was re-used.

   c. Location map of the re-used soil. Include GPS coordinates of its emplaced limits.

   d. A brief description of the purpose of the reused soil (e.g., general fill, utility trench backfill material, etc.). Include the depth and thickness of its placement.

   e. Photos of the site after placement of the re-used soil has been completed.

9. Record of Field Observation of any unanticipated UST or pipeline discovered during construction activities, including a copy of the completed DOH Notice of Intent to Close Underground Storage Tanks form, UST Closure Report, and all other associated documents.

10. The Close-out Report may be distinct to each contaminated media type/source. For sites with multiple contaminated media types/sources, Close-out Reports for each contaminated media type can be submitted separately or combined into a project-wide compilation of reports.

PART 4 – MEASUREMENT AND PAYMENT

4.01 BASIS OF MEASUREMENT AND PAYMENT

Work specified in this Section will be paid at the unit price measurement noted below.

Item No.	Item	Unit
01562.1	Management of Contaminated Media, Soil Disposal, and Soil Reuse	Allowance

Payment shall be full compensation for work prescribed in this Section and contract documents and stipulated below.

For ALLOWANCE items in the Proposal Schedule, the allowance is an estimate and the amount shall not exceed the maximum amount shown in the Proposal Schedule. Payment shall be the actual cost as invoiced by the Contractor and approved by the DOTA Engineer. The Contractor shall be allowed to include overhead, profit, insurance and/or other mark-ups, as stipulated in Section 9.5 of the 2016 General Provisions for Construction Projects, Air and Water Transportation Facilities Divisions.

Should the DOTA receive reports of any illegal dumping of material, and if illegal dumping is confirmed to have occurred, the DOTA will assess a Liquated Damages amount of $5,000 per truck per day, until the illegally dumped material has been cleaned up or the incident has been remedied to the satisfaction of the Engineer with the DOH's concurrence. The Contractor shall not be entitled to recover any Liquidated Damages assessed, even after the non-compliance has been corrected.

The Contractor shall be responsible for reimbursing DOTA for all citations, fines, and penalties levied by DOH, EPA, Department of Labor and Industrial Relations, or any other regulatory agency against the State due to the Contractor's failure to properly manage contaminated medias, including non-compliance with the DOTA EHE-EHMP, DOTA Site-Specific EHMP, or and Site-specific C-EHMP or C-EHMP Addendum. The Contractor shall reimburse the State within 30 calendar days for the full amount of any outstanding cost that the State has incurred. The State may deduct all incurred costs from the Contractor's monthly progress payments; however, the Contractor shall be responsible for reimbursing the State if the costs of correction exceed remaining payments owed to the Contractor.

If the Contractor fails to satisfactorily address the non-compliance item, DOTA reserves the right to employ outside assistance or use the State's own labor forces to provide necessary corrective measures. The Contractor shall be fully responsible for all cost and time. The State shall charge the Contractor such incurred costs plus any associated project engineering costs and shall make appropriate deductions from the Contractor's monthly progress payment.

END OF SECTION

SECTION 02209 - CRUSHED AGGREGATE BASE COURSE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The General Provision of the contract, including the General Provisions for Construction Projects (2016), Special Provisions, and General Requirements of the Specifications, apply to the work specified in this section. This Section shall be in accordance with FAA Specification Item P-209: Crushed Aggregate Base Course, as included as an attachment to this Section.

1.2 DESCRIPTION OF WORK

A. This Section consists of a base course composed of crushed aggregate base constructed on a prepared course in accordance with these specifications and in conformity to the dimensions and typical cross-sections shown on the plans, or as directed by the Engineer.

1.3 REFERENCES

A. Federal Aviation Administration (FAA)

1. FAA Specification Item P-209: Crushed Aggregate Base Course.

1.4 SUBMITTALS

A. Gradation of aggregate base course shall be submitted in accordance with FAA Specification Item P-209, paragraph 209-2.2.

B. Aggregate base samples and gradation test results from the in-place, uncompacted material shall be submitted in accordance with FAA Specification Item P-209, paragraph 209-2.3.

C. Field density results of compacted material meeting the requirements of FAA Specification Item P-209, paragraph 209-3.5 and 209-3.9.

PART 2 - PRODUCTS

2.1 Aggregates: in accordance with FAA Specification Item P-209, paragraph 209-2.1.

PART 3 - EXECUTION

3.1 Construction Methods shall be in accordance with FAA Specification Item P-209.

PART 4 - MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Method of measurement and payment shall be in accordance with FAA Specification Item P-209, paragraph 209-4.1.

4.2 BASIS OF PAYMENT

A. Basis for payment shall be in accordance with FAA Specification Item P-209, paragraph 209-5.1.

PART 5 - ATTACHMENTS

5.1 FAA Specification Item P-209 Crushed Aggregate Base Course.

Item P-209 Crushed Aggregate Base Course

DESCRIPTION

209-1.1 This item consists of a base course composed of crushed aggregate base constructed on a prepared course in accordance with these specifications and in conformity to the dimensions and typical cross-sections shown on the plans, or as directed by the Engineer.

MATERIALS

209-2.1 Crushed aggregate base. Crushed aggregate shall consist of clean, sound, durable particles of crushed stone, crushed gravel, and shall be free from coatings of clay, silt, organic material, clay lumps or balls or other deleterious materials or coatings. The method used to produce the crushed gravel shall result in the fractured particles in the finished product as consistent and uniform as practicable. Fine aggregate portion, defined as the portion passing the No. 4 sieve shall consist of fines from the coarse aggregate crushing operation. The fine aggregate shall be produced by crushing stone, gravel, that meet the coarse aggregate requirements for wear and soundness. Aggregate base material requirements are listed in the following table.

Crushed Aggregate Base Material Requirements

Material Test	Requirement	Standard
Coarse Aggregate		
Resistance to Degradation	Loss: 45% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Percentage of Fractured Particles	Minimum 90% by weight of particles with at least two fractured faces and 98% with at least one fractured face[1]	ASTM D5821
Flat Particles, Elongated Particles, or Flat and Elongated Particles	10% maximum, by weight, of flat, elongated, or flat and elongated particles [2]	ASTM D4791
Fine Aggregate		
Liquid limit	Less than or equal to 25	ASTM D4318
Plasticity Index	Not more than five (5)	ASTM D4318

[1] The area of each face shall be equal to at least 75% of the smallest mid-sectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces.

[2] A flat particle is one having a ratio of width to thickness greater than five (5); an elongated particle is one having a ratio of length to width greater than five (5).

209-2.2 Gradation requirements. The gradation of the aggregate base material shall meet the requirements of the gradation given in the following table when tested per ASTM C117 and ASTM C136. The gradation shall be well graded from coarse to fine and shall not vary from the lower limit on one sieve to the high limit on an adjacent sieve or vice versa.

Gradation of Aggregate Base

Sieve Size	Design Range Percentage by Weight passing	Contractor's Final Gradation	Job Control Grading Band Tolerances[1] (Percent)
2 inch	100		0
1-1/2 inch	95-100		±5
1 inch	70-95		±8
3/4 inch	55-85		±8
No. 4	30-60		±8
No. 40[2]	10-30		±5
No. 200[2]	0-8		±3

[1] The "Job Control Grading Band Tolerances for Contractor's Final Gradation" in the table shall be applied to "Contractor's Final Gradation" to establish a job control grading band. The full tolerance still applies if application of the tolerances results in a job control grading band outside the design range.

[2] The fraction of material passing the No 200 sieve shall not exceed two-thirds the fraction passing the No 40 sieve.

209-2.3 Sampling and Testing.

a. Aggregate base materials. The Contractor shall take samples of the aggregate base in accordance with ASTM D75 to verify initial aggregate base requirements and gradation. Material shall meet the requirements in paragraph 209-2.1. This sampling and testing will be the basis for approval of the aggregate base quality requirements.

b. Gradation requirements. The Contractor shall take at least two aggregate base samples per day in the presence of the Engineer to check the final gradation. Sampling shall be per ASTM D75. Material shall meet the requirements in paragraph 209-2.2. The samples shall be taken from the in-place, un-compacted material at sampling points and intervals designated by the Engineer.

209-2.4 Separation Geotextile. (Not Used)

209-2.5 Preparation of cut areas or areas where existing pavement has been removed. In those areas on which a subbase or base course is to be placed, the top 12 inches of subgrade shall be compacted to not less than 100 % of maximum density for non-cohesive soils, and 95% of maximum density for cohesive soils as determined by ASTM D1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

CONSTRUCTION METHODS

209-3.1 Control strip. The first half-day of construction shall be considered the control strip. The Contractor shall demonstrate, in the presence of the Engineer, that the materials, equipment, and construction processes meet the requirements of the specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined. The maximum compacted thickness may be increased to a maximum of 12 inches upon the Contractor's demonstration that approved equipment and operations will uniformly compact the lift to the specified density. The Engineer must witness this demonstration and approve the lift thickness prior to full production.

Control strips that do not meet specification requirements shall be reworked, re-compacted or removed and replaced at the Contractor's expense. Full operations shall not continue until the control strip has been accepted by the Engineer. The Contractor shall use the same equipment, materials, and construction methods for the remainder of construction, unless adjustments made by the Contractor are approved by the Engineer.

209-3.2 Preparing underlying subgrade and/or subbase. The underlying subgrade and/or subbase shall be checked and accepted by the Engineer before base course placing and spreading operations begin. Re-proof rolling of the subgrade or proof rolling of the subbase, at the Contractor's expense, may be required by the Engineer if the Contractor fails to ensure proper drainage or protect the subgrade and/or subbase. Any ruts or soft, yielding areas due to improper drainage conditions, hauling, or any other cause, shall be corrected before the base course is placed. To ensure proper drainage, the spreading of the base shall begin along the centerline of the pavement on a crowned section or on the high side of the pavement with a one-way slope.

209-3.3 Production. The aggregate shall be uniformly blended and, when at a satisfactory moisture content per paragraph 209-3.5, the approved material may be transported directly to the placement.

209-3.4 Placement. The aggregate shall be placed and spread on the prepared underlying layer by spreader boxes or other devices as approved by the Engineer, to a uniform thickness and width. The equipment shall have positive thickness controls to minimize the need for additional manipulation of the material. Dumping from vehicles that require re-handling shall not be permitted. Hauling over the uncompacted base course shall not be permitted.

The aggregate shall meet gradation and moisture requirements prior to compaction. The base course shall be constructed in lifts as established in the control strip, but not less than 4 inches nor more than 12 inches of compacted thickness.

When more than one lift is required to establish the layer thickness shown on the plans, the construction procedure described here shall apply to each lift. No lift shall be covered by subsequent lifts until tests verify that compaction requirements have been met. The Contractor shall rework, re-compact and retest any material placed which does not meet the specifications at the Contractor's expense.

209-3.5 Compaction. Immediately after completion of the spreading operations, compact each layer of the base course, as specified, with approved compaction equipment. The number, type, and weight of rollers shall be sufficient to compact the material to the required density within the same day that the aggregate is placed on the subgrade.

The field density of each compacted lift of material shall be at least 100% of the maximum density of laboratory specimens prepared from samples of the base material delivered to the jobsite. The laboratory specimens shall be compacted and tested in accordance with ASTM D1557. The moisture content of the material during placing operations shall be within ±2 percentage points of the optimum moisture content as determined by ASTM D6938. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

209-3.6 Weather limitations. Material shall not be placed unless the ambient air temperature is at least 40°F and rising. Work on base course shall not be conducted when the subgrade or subbase is wet or frozen or the base material contains frozen material.

209-3.7 Maintenance. The base course shall be maintained in a condition that will meet all specification requirements. When material has been exposed to excessive rain, snow, or freeze-thaw conditions, prior to placement of additional material, the Contractor shall verify that materials still meet all specification requirements. Equipment may be routed over completed sections of base course, provided that no damage results and the equipment is routed over the full width of the completed base course. Any damage resulting to the base course from routing equipment over the base course shall be repaired by the Contractor at the Contractor's expense.

209-3.8 Surface tolerances. After the course has been compacted, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches, reshaped and recompacted to grade until the required smoothness and accuracy are obtained and approved by the Engineer. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense. The smoothness and accuracy requirements specified here apply only to the top layer when base course is constructed in more than one layer.

a. Smoothness. The finished surface shall not vary more than 3/8-inch when tested with a 12-foot straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot straightedge for the full length of each line on a 50-foot grid.

b. Grade. The grade and crown shall be measured on a 50-foot grid and shall be within +0 and -1/2 inch of the specified grade, or as directed by the Engineer.

209-3.9 Acceptance sampling and testing. Crushed aggregate base course shall be accepted for density and thickness on an area basis. Two tests shall be made for density and thickness for each 1200 square yds. Sampling locations will be determined on a random basis per ASTM D3665.

a. Density. Each area shall be accepted for density when the field density is at least 100% of the maximum density of laboratory specimens compacted and tested per ASTM 1557. The in-place field density shall be determined per ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938. If the specified density is not attained, the area represented by the failed test must be reworked and/or recompacted and two additional random tests made at the Contractor's expense. This procedure shall be followed until the specified density is reached. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

b. Thickness. Depth tests shall be made by test holes at least 3 inches in diameter that extend through the base, or as otherwise directed by the Engineer. The thickness of the base course shall

be within +0 and -1/2 inch of the specified thickness as determined by depth tests taken by the Contractor in the presence of the Engineer for each area. Where the thickness is deficient by more than 1/2-inch, the Contractor shall correct such areas at no additional cost by scarifying to a depth of at least 3 inches, adding new material of proper gradation, and the material shall be blended and recompacted to grade. The Contractor shall replace, at his expense, base material where depth tests have been taken.

METHOD OF MEASUREMENT

209-4.1 The quantity of crushed aggregate base course will be determined by measurement of the number of cubic yards of material actually constructed and accepted by the Engineer as complying with the plans and specifications. Base materials shall not be included in any other excavation quantities.

BASIS OF PAYMENT

209-5.1 Payment shall be made at the contract unit price per cubic yard for crushed aggregate base course. This price shall be full compensation for furnishing all materials, for preparing and placing these materials, and for all labor, equipment tools, and incidentals necessary to complete the item.

Payment will be made under:

ITEM NO.	ITEM	UNIT
02209.1	Crushed Aggregate Base Course	Cubic Yard

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM C29	Standard Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75-μm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates

ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2700 kN-m/m^3))
ASTM D2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4643	Standard Test Method for Determination of Water Content of Soil and Rock by Microwave Oven Heating
ASTM D4751	Standard Test Methods for Determining Apparent Opening Size of a Geotextile
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM D7928	Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis

American Association of State Highway and Transportation Officials (AASHTO)

M288	Standard Specification for Geosynthetic Specification for Highway Applications

END OF ITEM P-209

--------END OF SECTION 02209--------

SECTION 02401 - ASPHALT MIX PAVEMENT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

The General Provision of the contract, including the General Provisions for Construction Projects (2016), Special Provisions, and General Requirements of the Specifications, apply to the work specified in this section. This Section shall be in accordance with FAA Specification Item P-401: Asphalt Mix Pavement, as included as an attachment to this Section.

1.2 DESCRIPTION OF WORK

A. This Section shall consist of pavement courses composed of mineral aggregate and asphalt binder mixed in a central mixing plant and placed on a prepared base or stabilized course in accordance with these specifications and shall conform to the lines, grades, thicknesses, and typical cross-sections shown on the plans, or as directed by the Engineer. Each course shall be constructed to the depth, typical section, and elevation required by the plans, or as directed by the Engineer and shall be rolled, finished, and approved before the placement of the next course.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02602 – Emulsified Asphalt Prime Coat; FAA Specification Item P-602.

B. Section 02603 – Emulsified Asphalt Tack Coat; FAA Specification Item P-603.

C. Section 02621 – Saw-Cut Grooves; FAA Specification Item P-621.

1.4 REFERENCES

A. Federal Aviation Administration (FAA)

1. FAA Specification Item P-401: Asphalt Mix Pavement.

1.5 SUBMITTALS

A. Job mix formula (JMF) laboratory's current accreditation and accredited test methods shall be submitted in accordance with the requirements of FAA Specification Item P-401, paragraph 401-3.2.

B. JMF mixture shall be submitted in accordance with the requirements of FAA Specification Item P-401, paragraph 401-3.3.

C. Coatings for truck beds to prevent asphalt from sticking to the truck beds shall be submitted in accordance with the requirements of FAA Specification Item P-401, paragraph 401-4.4.

D. A laydown plan shall be submitted in accordance with the requirements of FAA Specification Item P-401, paragraph 401-4.12.

E. A lighting plan shall be submitted in accordance with the requirements of FAA Specification Item P-401, paragraph 401-4.17.

PART 2 - PRODUCTS

2.1 Aggregates: in accordance with FAA Specification Item P-401, paragraph 401-2.1.

2.2 Mineral Filler: in accordance with FAA Specification Item P-401, paragraph 401-2.2.

2.3 Asphalt Binder: in accordance with FAA Specification Item P-401, paragraph 401-2.3.

2.4 Anti-Stripping Agent: in accordance with FAA Specification Item P-401, paragraph 401-2.4.

2.5 Composition of mixtures, job mix formula (JMF) laboratory, JMF, and control strip shall be in accordance with FAA Specification Item P-401.

PART 3 - EXECUTION

3.1 Construction Methods shall be in accordance with FAA Specification Item P-401.

3.2 The Contractor Quality Control shall be in accordance with FAA Specification Item P-401.

3.3 Material Acceptance shall be in accordance with FAA Specification Item P-401.

PART 4 - MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Method of measurement and payment shall be in accordance with FAA Specification Item P-401, paragraph 401-7.1.

4.2 BASIS OF PAYMENT

A. Basis for payment shall be in accordance with FAA Specification Item P-401, paragraph 401-8.1 and 401-8.2.

PART 5 - ATTACHMENTS

5.1 FAA Specification Item P-401 Asphalt Mix Pavement.

Item P-401 Asphalt Mix Pavement

DESCRIPTION

401-1.1 This item shall consist of pavement courses composed of mineral aggregate and asphalt binder mixed in a central mixing plant and placed on a prepared base or stabilized course in accordance with these specifications and shall conform to the lines, grades, thicknesses, and typical cross-sections shown on the plans, or as directed by the Engineer. Each course shall be constructed to the depth, typical section, and elevation required by the plans, or as directed by the Engineer and shall be rolled, finished, and approved before the placement of the next course.

MATERIALS

401-2.1 Aggregate. Aggregates shall consist of crushed stone, crushed gravel, crushed slag, screenings, natural sand, and mineral filler, as required. The aggregates should have no known history of detrimental pavement staining due to ferrous sulfides, such as pyrite. Coarse aggregate is the material retained on the No. 4 sieve. Fine aggregate is the material passing the No. 4 sieve.

a. Coarse aggregate. Coarse aggregate shall consist of sound, tough, durable particles, free from films of matter that would prevent thorough coating and bonding with the asphalt material and free from organic matter and other deleterious substances. Coarse aggregate material requirements are given in the table below.

Coarse Aggregate Material Requirements

Material Test	Requirement	Standard
Resistance to Degradation	Loss: 40% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Clay lumps and friable particles	1.0% maximum	ASTM C142
Percentage of Fractured Particles	For pavements designed for aircraft gross weights of 60,000 pounds or more: Minimum 75% by weight of particles with at least two fractured faces and 85% with at least one fractured face[1]	ASTM D5821
	For pavements designed for aircraft gross weights less than 60,000 pounds: Minimum 50% by weight of particles with at least two fractured faces and 65% with at least one fractured face[1]	
Flat, Elongated, or Flat and Elongated Particles	8% maximum, by weight, of flat, elongated, or flat and elongated particles at 5:1 [2]	ASTM D4791
Bulk density of slag [3]	Weigh not less than 70 pounds per cubic foot	ASTM C29.

[1] The area of each face shall be equal to at least 75% of the smallest mid-sectional area of the piece. When two fractured faces are contiguous, the angle between the planes of fractures shall be at least 30 degrees to count as two fractured faces.

[2] A flat particle is one having a ratio of width to thickness greater than five (5); an elongated particle is one having a ratio of length to width greater than five (5).

[3] Only required if slag is specified.

b. Fine aggregate. Fine aggregate shall consist of clean, sound, tough, durable, angular shaped particles produced by crushing stone, slag, or gravel and shall be free from coatings of clay, silt, or other objectionable matter. Natural (non-manufactured) sand may be used to obtain the gradation of the fine aggregate blend or to improve the workability of the mix. Fine aggregate material requirements are listed in the table below.

Fine Aggregate Material Requirements

Material Test	Requirement	Standard
Liquid limit	25 maximum	ASTM D4318
Plasticity Index	4 maximum	ASTM D4318
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 10% maximum using Sodium sulfate - or - 15% maximum using magnesium sulfate	ASTM C88
Clay lumps and friable particles	0.3% maximum	ASTM C142
Sand equivalent	45 minimum	ASTM D2419
Natural Sand	15% maximum by weight of total aggregate	ASTM D1073

c. Sampling. ASTM D75 shall be used in sampling coarse and fine aggregate.

401-2.2 Mineral filler. Mineral filler (baghouse fines) may be added in addition to material naturally present in the aggregate. Mineral filler shall meet the requirements of ASTM D242.

Mineral Filler Requirements

Material Test	Requirement	Standard
Plasticity Index	4 maximum	ASTM D4318

401-2.3 Asphalt binder. Asphalt binder shall conform to ASTM D6373 Performance Grade (PG) 76-22.

Asphalt Binder PG Plus Test Requirements

Material Test	Requirement	Standard
Elastic Recovery	75% minimum	ASTM D6084

[1] Follow procedure B on RTFO aged binder.]

401-2.4 Anti-stripping agent. Any anti-stripping agent or additive (anti-strip) shall be heat stable and shall not change the asphalt binder grade beyond specifications. Anti-strip shall be an approved material of the Department of Transportation of the State in which the project is located.

COMPOSITION

401-3.1 Composition of mixture(s). The asphalt mix shall be composed of a mixture of aggregates, filler and anti-strip agent if required, and asphalt binder. The aggregate fractions shall be sized, handled in separate size groups, and combined in such proportions that the resulting mixture meets the grading requirements of the job mix formula (JMF).

401-3.2 Job mix formula (JMF) laboratory. The laboratory used to develop the JMF shall possess a current certificate of accreditation, listing D3666 from a national accrediting authority and all test methods required for developing the JMF; and be listed on the accrediting authority's

website. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the Engineer prior to start of construction.

401-3.3 Job mix formula (JMF). No asphalt mixture shall be placed until an acceptable mix design has been submitted to the Engineer for review and accepted in writing. The Engineer's review shall not relieve the Contractor of the responsibility to select and proportion the materials to comply with this section.

When the project requires asphalt mixtures of differing aggregate gradations and/or binders, a separate JMF shall be submitted for each mix. Add anti-stripping agent to meet tensile strength requirements.

The JMF shall be prepared by an accredited laboratory that meets the requirements of paragraph 401-3.2. The asphalt mixture shall be designed using procedures contained in Asphalt Institute MS-2 Mix Design Manual, 7th Edition**.** Samples shall be prepared and compacted using a Marshall compactor in accordance with ASTM D6926.

Should a change in sources of materials be made, a new JMF must be submitted to the Engineer for review and accepted in writing before the new material is used. After the initial production JMF has been approved by the Engineer and a new or modified JMF is required for whatever reason, the subsequent cost of the new or modified JMF, including a new control strip when required by the Engineer, will be borne by the Contractor.

The Engineer may request samples at any time for testing, prior to and during production, to verify the quality of the materials and to ensure conformance with the applicable specifications.

The JMF shall be submitted in writing by the Contractor at least 30 days prior to the start of paving operations. The JMF shall be developed within the same construction season using aggregates proposed for project use.

The JMF shall be dated, and stamped or sealed by the responsible professional Engineer of the laboratory and shall include the following items as a minimum:

- Manufacturer's Certificate of Analysis (COA) for the asphalt binder used in the JMF in accordance with paragraph 401-2.3. Certificate of asphalt performance grade is with modifier already added, if used and must indicate compliance with ASTM D6373. For plant modified asphalt binder, certified test report indicating grade certification of modified asphalt binder.
- Manufacturer's Certificate of Analysis (COA) for the anti-stripping agent if used in the JMF in accordance with paragraph 401-2.4.
- Certified material test reports for the course and fine aggregate and mineral filler in accordance with paragraphs 401-2.1.
- Percent passing each sieve size for individual gradation of each aggregate cold feed and/or hot bin; percent by weight of each cold feed and/or hot bin used; and the total combined gradation in the JMF.
- Specific Gravity and absorption of each coarse and fine aggregate.
- Percent natural sand.
- Percent fractured faces.

- Percent by weight of flat particles, elongated particles, and flat and elongated particles (and criteria).
- Percent of asphalt.
- Number of blows
- Laboratory mixing and compaction temperatures.
- Supplier-recommended field mixing and compaction temperatures.
- Plot of the combined gradation on a 0.45 power gradation curve.
- Graphical plots of air voids, voids in the mineral aggregate (VMA), and unit weight versus asphalt content. To achieve minimum VMA during production, the mix design needs to account for material breakdown during production.
- Tensile Strength Ratio (TSR).
- Type and amount of Anti-strip agent when used.
- Asphalt Pavement Analyzer (APA) or Hamburg Wheel test results.
- Date the JMF was developed. Mix designs that are not dated or which are from a prior construction season shall not be accepted.

Table 1. Asphalt Design Criteria

Test Property	Value	Test Method
Number of blows	75	
Air voids (%)	3.5	ASTM D3203
Percent voids in mineral aggregate (VMA), minimum	See Table 2	ASTM D6995
Tensile Strength Ratio (TSR)[1]	not less than 80 at a saturation of 70-80%	ASTM D4867
Asphalt Pavement Analyzer (APA)[2]	Less than 10 mm @ 4000 passes	AASHTO T340 at 250 psi hose pressure at 64°C test temperature

[1] Test specimens for TSR shall be compacted at 7 ± 1.0 % air voids. In areas subject to freeze-thaw, use freeze-thaw conditioning in lieu of moisture conditioning per ASTM D4867.

[2] AASHTO T340 at 100 psi hose pressure at 64°C test temperature may be used in the interim. If this method is used the required Value shall be less than 5 mm @ 8000 passes

[3] Where APA not available, use Hamburg Wheel test (AASHTO T-324) 10mm @ 20,000 passes at 50°C.

The mineral aggregate shall be of such size that the percentage composition by weight, as determined by laboratory sieves, will conform to the gradation or gradations specified in Table 2 when tested in accordance with ASTM C136 and ASTM C117.

The gradations in Table 2 represent the limits that shall determine the suitability of aggregate for use from the sources of supply; be well graded from coarse to fine and shall not vary from the low limit on one sieve to the high limit on the adjacent sieve, or vice versa.

Table 2. Aggregate - Asphalt Pavements

Sieve Size	Percentage by Weight Passing Sieve
1 inch	--
3/4 inch	100
1/2 inch	90-100
3/8 inch	72-88
No. 4	53-73
No. 8	38-60
No. 16	26-48
No. 30	18-38
No. 50	11-27
No. 100	6-18
No. 200	3-6
Minimum Voids in Mineral Aggregate (VMA)[1]	15.0
Asphalt Percent:	
Stone or gravel	5.0-7.5
Recommended Minimum Construction Lift Thickness	2 inch

[1] To achieve minimum VMA during production, the mix design needs to account for material breakdown during production.

The aggregate gradations shown are based on aggregates of uniform specific gravity. The percentages passing the various sieves shall be corrected when aggregates of varying specific gravities are used, as indicated in the Asphalt Institute MS-2 Mix Design Manual, 7th Edition.

Variations on the aggregate gradations shall be submitted to the Engineer based on the location and scope of the paving work.

401-3.4 The potential use of Recycled asphalt pavement (RAP), including the composition and application, shall be submitted to the Engineer, taking into account the location of the paving work.

401-3.5 Control Strip. A control strip is not required.

CONSTRUCTION METHODS

401-4.1 Weather limitations. The asphalt shall not be placed upon a wet surface or when the surface temperature of the underlying course is less than specified in Table 4. The temperature requirements may be waived by the Engineer, if requested; however, all other requirements including compaction shall be met.

Table 4. Surface Temperature Limitations of Underlying Course

Mat Thickness	Base Temperature (Minimum)	
	°F	°C
3 inches or greater	40 [1]	4
Greater than 2 inches but less than 3 inches	45	7

401-4.2 Asphalt plant. Plants used for the preparation of asphalt shall conform to the requirements of American Association of State Highway and Transportation Officials (AASHTO) M156 including the following items.

a. Inspection of plant. The Engineer, or Engineer's authorized representative, shall have access, at all times, to all areas of the plant for checking adequacy of equipment; inspecting operation of the plant: verifying weights, proportions, and material properties; and checking the temperatures maintained in the preparation of the mixtures.

b. Storage bins and surge bins. The asphalt mixture stored in storage and/or surge bins shall meet the same requirements as asphalt mixture loaded directly into trucks. Asphalt mixture shall not be stored in storage and/or surge bins for a period greater than twelve (12) hours. If the Engineer determines there is an excessive heat loss, segregation, or oxidation of the asphalt mixture due to temporary storage, temporary storage shall not be allowed.

401-4.3 Aggregate stockpile management. Aggregate stockpiles shall be constructed in a manner that prevents segregation and intermixing of deleterious materials. Aggregates from different sources shall be stockpiled, weighed and batched separately at the asphalt batch plant. Aggregates that have become segregated or mixed with earth or foreign material shall not be used.

A continuous supply of materials shall be provided to the work to ensure continuous placement.

401-4.4 Hauling equipment. Trucks used for hauling asphalt shall have tight, clean, and smooth metal beds. To prevent the asphalt from sticking to the truck beds, the truck beds shall be lightly coated with a minimum amount of paraffin oil, lime solution, or other material approved by the Engineer. Petroleum products shall not be used for coating truck beds. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary, to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers shall be securely fastened.

401-4.4.1 Material transfer vehicle (MTV). Material transfer vehicles used to transfer the material from the hauling equipment to the paver, shall use a self-propelled, material transfer vehicle with a swing conveyor that can deliver material to the paver without making contact with the paver. The MTV shall be able to move back and forth between the hauling equipment and the paver providing material transfer to the paver, while allowing the paver to operate at a constant speed. The Material Transfer Vehicle will have remixing and storage capability to prevent physical and thermal segregation.

401-4.5 Asphalt pavers. Asphalt pavers shall be self-propelled with an activated heated screed, capable of spreading and finishing courses of asphalt that will meet the specified thickness, smoothness, and grade. The paver shall have sufficient power to propel itself and the hauling equipment without adversely affecting the finished surface. The asphalt paver shall be equipped

with a control system capable of automatically maintaining the specified screed grade and elevation.

If the spreading and finishing equipment in use leaves tracks or indented areas, or produces other blemishes in the pavement that are not satisfactorily corrected by the scheduled operations, the use of such equipment shall be discontinued.

The paver shall be capable of paving to a minimum width specified in paragraph 401-4.12.

401-4.6 Rollers. The number, type, and weight of rollers shall be sufficient to compact the asphalt to the required density while it is still in a workable condition without crushing of the aggregate, depressions or other damage to the pavement surface. Rollers shall be in good condition, clean, and capable of operating at slow speeds to avoid displacement of the asphalt. All rollers shall be specifically designed and suitable for compacting asphalt concrete and shall be properly used. Rollers that impair the stability of any layer of a pavement structure or underlying soils shall not be used.

401-4.7 Density device. The Contractor shall have on site a density gauge during all paving operations in order to assist in the determination of the optimum rolling pattern, type of roller and frequencies, as well as to monitor the effect of the rolling operations during production paving. The Contractor shall supply a qualified technician during all paving operations to calibrate the gauge and obtain accurate density readings for all new asphalt. These densities shall be supplied to the Engineer upon request at any time during construction. No separate payment will be made for supplying the density gauge and technician.

401-4.8 Preparation of asphalt binder. The asphalt binder shall be heated in a manner that will avoid local overheating and provide a continuous supply of the asphalt binder to the mixer at a uniform temperature. The temperature of unmodified asphalt binder delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles, but shall not exceed 325°F when added to the aggregate. The temperature of modified asphalt binder shall be no more than 350°F when added to the aggregate.

401-4.9 Preparation of mineral aggregate. The aggregate for the asphalt shall be heated and dried. The maximum temperature and rate of heating shall be such that no damage occurs to the aggregates. The temperature of the aggregate and mineral filler shall not exceed 350°F when the asphalt binder is added. Particular care shall be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

401-4.10 Preparation of Asphalt mixture. The aggregates and the asphalt binder shall be weighed or metered and mixed in the amount specified by the JMF. The combined materials shall be mixed until the aggregate obtains a uniform coating of asphalt binder and is thoroughly distributed throughout the mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but not less than 25 seconds for batch plants. The wet mixing time for all plants shall be established by the Contractor, based on the procedure for determining the percentage of coated particles described in ASTM D2489, for each individual plant and for each type of aggregate used. The wet mixing time will be set to achieve 95% of coated particles. For continuous mix plants, the minimum mixing time shall be determined by dividing the weight of

its contents at operating level by the weight of the mixture delivered per second by the mixer. The moisture content of all asphalt upon discharge shall not exceed 0.5%.

401-4.11 Application of Prime and Tack Coat. Immediately before placing the asphalt mixture, the underlying course shall be cleaned of all dust and debris.

A prime coat shall be applied to aggregate base prior to placing the asphalt mixture.

A tack coat shall be applied in accordance with Section 02603 to all vertical and horizontal asphalt and concrete surfaces prior to placement of the first and each subsequent lift of asphalt mixture.

401-4.12 Laydown plan, transporting, placing, and finishing. Prior to the placement of the asphalt, the Contractor shall prepare a laydown plan with the sequence of paving lanes and width to minimize the number of cold joints; the location of any temporary ramps; laydown temperature; and estimated time of completion for each portion of the work (milling, paving, rolling, cooling, etc.). The laydown plan and any modifications shall be approved by the Engineer.

Deliveries shall be scheduled so that placing and compacting of asphalt is uniform with minimum stopping and starting of the paver. Hauling over freshly placed material shall not be permitted until the material has been compacted, as specified, and allowed to cool to approximately ambient temperature. The Contractor, at their expense, shall be responsible for repair of any damage to the pavement caused by hauling operations.

Contractor shall survey each lift of asphalt surface course and certify to Engineer that every lot of each lift meets the grade tolerances before the next lift can be placed.

Edges of existing asphalt pavement abutting the new work shall be saw cut and the cut off material and laitance removed. Apply a tack coat in accordance with Section 02603 before new asphalt material is placed against it.

The speed of the paver shall be regulated to eliminate pulling and tearing of the asphalt mat. Placement of the asphalt mix shall begin along the centerline of a crowned section or on the high side of areas with a one way slope unless shown otherwise on the laydown plan as accepted by the Engineer. The asphalt mix shall be placed in consecutive adjacent lanes having a minimum width of 15 feet except where edge lanes require less width to complete the area. Additional screed sections attached to widen the paver to meet the minimum lane width requirements must include additional auger sections to move the asphalt mixture uniformly along the screed extension.

The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least one foot; however, the joint in the surface top course shall be at the centerline of crowned pavements. Transverse joints in one course shall be offset by at least 10 feet from transverse joints in the previous course. Transverse joints in adjacent lanes shall be offset a minimum of 10 feet. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the asphalt may be spread and luted by hand tools.

The Engineer may at any time, reject any batch of asphalt, on the truck or placed in the mat, which is rendered unfit for use due to contamination, segregation, incomplete coating of aggregate, or overheated asphalt mixture. Such rejection may be based on only visual inspection or temperature measurements. In the event of such rejection, the Contractor may take a representative sample of the rejected material in the presence of the Engineer, and if it can be demonstrated in the laboratory,

in the presence of the Engineer, that such material was erroneously rejected, payment will be made for the material at the contract unit price.

Areas of segregation in the surface course, as determined by the Engineer, shall be removed and replaced at the Contractor's expense. The area shall be removed by saw cutting and milling a minimum of the construction lift thickness as specified in paragraph 401-3.3, Table 2 for the approved mix design. The area to be removed and replaced shall be a minimum width of the paver and a minimum of 10 feet long.

401-4.13 Compaction of asphalt mixture. After placing, the asphalt mixture shall be thoroughly and uniformly compacted by self-propelled rollers. The surface shall be compacted as soon as possible when the asphalt has attained sufficient stability so that the rolling does not cause undue displacement, cracking or shoving. The sequence of rolling operations and the type of rollers used shall be at the discretion of the Contractor. The speed of the roller shall, at all times, be sufficiently slow to avoid displacement of the hot mixture and be effective in compaction. Any surface defects and/or displacement occurring as a result of the roller, or from any other cause, shall be corrected at the Contractor's expense.

Sufficient rollers shall be furnished to handle the output of the plant. Rolling shall continue until the surface is of uniform texture, true to grade and cross-section, and the required field density is obtained. To prevent adhesion of the asphalt to the roller, the wheels shall be equipped with a scraper and kept moistened with water as necessary.

In areas not accessible to the roller, the mixture shall be thoroughly compacted with approved power tampers.

Any asphalt that becomes loose and broken, mixed with dirt, contains check-cracking, or in any way defective shall be removed and replaced with fresh hot mixture and immediately compacted to conform to the surrounding area. This work shall be done at the Contractor's expense. Skin patching shall not be allowed.

401-4.14 Joints. The formation of all joints shall be made to ensure a continuous bond between the courses and obtain the required density. All joints shall have the same texture as other sections of the course and meet the requirements for smoothness and grade.

The roller shall not pass over the unprotected end of the freshly laid asphalt except when necessary to form a transverse joint. When necessary to form a transverse joint, it shall be made by means of placing a bulkhead or by tapering the course. The tapered edge shall be cut back to its full depth and width on a straight line to expose a vertical face prior to placing the adjacent lane. In both methods, all contact surfaces shall be coated with an asphalt tack coat before placing any fresh asphalt against the joint.

Longitudinal joints which have been left exposed for more than four (4) hours; the surface temperature has cooled to less than 175°F; or are irregular, damaged, uncompacted or otherwise defective shall be cut back with a cutting wheel or pavement saw a maximum of 3 inches to expose a clean, sound, uniform vertical surface for the full depth of the course. All cutback material and any laitance produced from cutting joints shall be removed from the project. Asphalt tack coat in accordance with P-603 shall be applied to the clean, dry joint prior to placing any additional fresh asphalt against the joint. The cost of this work shall be considered incidental to the cost of the asphalt.

401-4.15 Saw-cut grooving. Saw-cut grooves shall be provided as specified in Section 02621.

401-4.16 Diamond grinding. Diamond grinding shall be completed prior to pavement grooving. Diamond grinding shall be accomplished by sawing with saw blades impregnated with industrial diamond abrasive.

Diamond grinding shall be performed with a machine designed specifically for diamond grinding capable of cutting a path at least 3 feet (0.9 m) wide. The saw blades shall be 1/8-inch (3-mm) wide with a sufficient number of blades to create grooves between 0.090 and 0.130 inches (2 and 3.5 mm) wide; and peaks and ridges approximately 1/32 inch (1 mm) higher than the bottom of the grinding cut. The actual number of blades will be determined by the Contractor and depend on the hardness of the aggregate. Equipment or grinding procedures that cause ravels, aggregate fractures, spalls or disturbance to the pavement will not be permitted. Contractor shall demonstrate to the Engineer that the grinding equipment will produce satisfactory results prior to making corrections to surfaces. Grinding will be tapered in all directions to provide smooth transitions to areas not requiring grinding. The slurry resulting from the grinding operation shall be continuously removed and the pavement left in a clean condition. The Contractor shall apply a light coat of asphalt emulsion as directed by the Engineer.

401-4.17 Nighttime paving requirements. The Contractor shall provide adequate lighting during any nighttime construction. A lighting plan shall be submitted by the Contractor and approved by the Engineer prior to the start of any nighttime work. All work shall be in accordance with the approved CSPP and lighting plan.

CONTRACTOR QUALITY CONTROL (CQC)

401-5.2 Contractor quality control (QC) facilities. The Contractor shall provide or contract for testing facilities in accordance with FAA AC 150/5370-10H. The Engineer shall be permitted unrestricted access to inspect the Contractor's QC facilities and witness QC activities. The Engineer will advise the Contractor in writing of any noted deficiencies concerning the QC facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to be adversely affecting the test results, the incorporation of the materials into the work shall be suspended immediately and will not be permitted to resume until the deficiencies are satisfactorily corrected.

401-5.3 Contractor QC testing. The Contractor shall perform all QC tests necessary to control the production and construction processes applicable to these specifications. The testing program shall include, but not necessarily be limited to, tests for the control of asphalt content, aggregate gradation, temperatures, aggregate moisture, field compaction, and surface smoothness.

Testing requirements, including test samples and specific tests, may vary depending on the scope of paving work performed. Variations of the following testing requirements shall be submitted to the Engineer for review and approval.

a. **Asphalt content.** A minimum of two tests shall be performed per day in accordance with ASTM D6307 or ASTM D2172 for determination of asphalt content. When using ASTM D6307, the correction factor shall be determined as part of the first test performed at the beginning of plant production; and as part of every tenth test performed thereafter. The asphalt content for the day will be determined by averaging the test results.

b. Gradation. Aggregate gradations shall be determined a minimum of twice per day from mechanical analysis of extracted aggregate in accordance with ASTM D5444, ASTM C136, and ASTM C117.

c. Moisture content of aggregate. The moisture content of aggregate used for production shall be determined a minimum of once per day in accordance with ASTM C566.

d. Moisture content of asphalt. The moisture content shall be determined once per day in accordance with AASHTO T329 or ASTM D1461.

e. Temperatures. Temperatures shall be checked, at least four times per day, at necessary locations to determine the temperatures of the dryer, the asphalt binder in the storage tank, the asphalt at the plant, and the asphalt at the job site.

f. In-place density monitoring. The Contractor shall conduct any necessary testing to ensure that the specified density is being achieved. A nuclear gauge may be used to monitor the pavement density in accordance with ASTM D2950.

g. Smoothness for Contractor Quality Control.

The Contractor shall perform smoothness testing in transverse and longitudinal directions daily to verify that the construction processes are producing pavement with variances less than ¼ inch in 12 feet, identifying areas that may pond water which could lead to hydroplaning of aircraft. If the smoothness criteria is not met, appropriate changes and corrections to the construction process shall be made by the Contractor before construction continues.

The Contractor may use a 12-foot straightedge, a rolling inclinometer meeting the requirements of ASTM E2133 or rolling external reference device that can simulate a 12-foot straightedge approved by the Engineer. Straight-edge testing shall start with one-half the length of the straightedge at the edge of pavement section being tested and then moved ahead one-half the length of the straightedge for each successive measurement. Testing shall be continuous across all joints. The surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between the two high points. If the rolling inclinometer or external reference device is used, the data may be evaluated using the FAA profile program, ProFAA, or FHWA ProVal, using the 12-foot straightedge simulation function.

Smoothness readings shall not be made across grade changes or cross slope transitions. The transition between new and existing pavement shall be evaluated separately for conformance with the plans, or as directed by the Engineer.

(1) Transverse measurements. Transverse measurements shall be taken for each day's production placed. Transverse measurements shall be taken perpendicular to the pavement centerline each 50 feet (15 m) or more often as determined by the Engineer. The joint between lanes shall be tested separately to facilitate smoothness between lanes.

(2) Longitudinal measurements. Longitudinal measurements shall be taken for each day's production placed. Longitudinal tests shall be parallel to the centerline of paving; at the center of paving lanes when widths of paving lanes are less than 20 feet; and at the third points of paving lanes when widths of paving lanes are 20 ft or greater. When placement abuts previously

placed material the first measurement shall start with one half the length of the straight edge on the previously placed material.

Deviations on the final surface course in either the transverse or longitudinal direction that will trap water greater than 1/4 inch shall be corrected with diamond grinding per paragraph 401-4.16 or by removing and replacing the surface course to full depth. Grinding shall be tapered in all directions to provide smooth transitions to areas not requiring grinding. All areas in which diamond grinding has been performed shall be subject to the final pavement thickness tolerances specified in paragraph 401-6.1d(3). Areas that have been ground shall be sealed with a surface treatment in accordance with FAA Specification Item P-608. To avoid the surface treatment creating any conflict with runway or taxiway markings, it may be necessary to seal a larger area.

Control charts shall be kept to show area of each day's placement and the percentage of corrective grinding required. Corrections to production and placement shall be initiated when corrective grinding is required. If the Contractor's machines and/or methods produce significant areas that need corrective actions in excess of 10 percent of a day's production, production shall be stopped until corrective measures are implemented by the Contractor.

h. Grade. Grade shall be evaluated daily to allow adjustments to paving operations when grade measurements do not meet specifications. As a minimum, grade shall be evaluated prior to and after the placement of the first lift and after placement of the surface lift.

Measurements will be taken at appropriate gradelines (as a minimum at center and edges of paving lane) and longitudinal spacing as shown on cross-sections and plans, or as directed by the Engineer. The final surface of the pavement will not vary from the gradeline elevations and cross-sections shown on the plans, or as directed by the Engineer by more than 1/2 inch (12 mm) vertically 0.1 feet laterally. The documentation will be provided by the Contractor to the Engineer within 24 hours**.**

Areas with humps or depressions that exceed grade or smoothness criteria and that retain water on the surface must be ground off provided the course thickness after grinding is not more than 1/2 inch (12 mm) less than the thickness specified on the plans, or as directed by the Engineer. Grinding shall be in accordance with paragraph 401-4.16.

The Contractor shall repair low areas or areas that cannot be corrected by grinding by removal of deficient areas to the depth of the final course plus ½ inch and replacing with new material. Skin patching is not allowed.

401-5.4 Sampling. When directed by the Engineer, the Contractor shall sample and test any material that appears inconsistent with similar material being sampled, unless such material is voluntarily removed and replaced or deficiencies corrected by the Contractor. All sampling shall be in accordance with standard procedures specified.

401-5.6 QC reports. The Contractor shall maintain records and shall submit reports of QC activities daily.

MATERIAL ACCEPTANCE

401-6.1 Acceptance sampling and testing.

If the Engineer deems that the Contractor's work is unacceptable based on materials, equipment and work quality under specification sections 02209, 02401, 02603, the contractor shall remove

and replace deficient work at their expense. Unacceptable work based on Smoothness, Grade, or Texture shall be corrected by the Contractor at their expense as follows:

Unacceptable areas shall be made acceptable by removing and replacing sufficient material at a minimum 1-1/2" depth to correct low spots. Surfaces may be ground down to correct high spots. Failures, segregation, and/or heat checking in finished pavements must be corrected by the removal and replacement of an area that is at least one foot longer and one foot wider than the pavement that was placed by the Contractor.

METHOD OF MEASUREMENT

401-7.1 Measurement. Asphalt shall be measured by the number of tons of asphalt used in the accepted work. Batch weights or truck scale weights will be used to determine the basis for the tonnage.

BASIS OF PAYMENT

401-8.1 Payment. The accepted quantity of asphalt mix pavement work will be paid for at the applicable contract amount of accepted tons used in the accepted work. The price shall be compensation for furnishing all materials, for all preparation, mixing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

401-8.2 Payment.

Payment will be made under:

ITEM NO.	ITEM	UNIT
02401.1	Asphalt Mix Pavement	Ton

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM C29	Standard Test Method for Bulk Density ("Unit Weight") and Voids in Aggregate
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75-μm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C127	Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate

ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM C566	Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D242	Standard Specification for Mineral Filler for Bituminous Paving Mixtures
ASTM D946	Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction
ASTM D979	Standard Practice for Sampling Asphalt Paving Mixtures
ASTM D1073	Standard Specification for Fine Aggregate for Asphalt Paving Mixtures
ASTM D1188	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
ASTM D2172	Standard Test Method for Quantitative Extraction of Bitumen from Asphalt Paving Mixtures
ASTM D1461	Standard Test Method for Moisture or Volatile Distillates in Asphalt Paving Mixtures
ASTM D2041	Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D2489	Standard Practice for Estimating Degree of Particle Coating of Bituminous-Aggregate Mixtures
ASTM D2726	Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures
ASTM D2950	Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods
ASTM D3203	Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
ASTM D3381	Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction
ASTM D3665	Standard Practice for Random Sampling of Construction Materials

ASTM D3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4552	Standard Practice for Classifying Hot-Mix Recycling Agents
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D4867	Standard Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures
ASTM D5361	Standard Practice for Sampling Compacted Asphalt Mixtures for Laboratory Testing
ASTM D5444	Standard Test Method for Mechanical Size Analysis of Extracted Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
ASTM D6084	Standard Test Method for Elastic Recovery of Bituminous Materials by Ductilometer
ASTM D6307	Standard Test Method for Asphalt Content of Hot Mix Asphalt by Ignition Method
ASTM D6373	Standard Specification for Performance Graded Asphalt Binder
ASTM D6752	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Automatic Vacuum Sealing Method
ASTM D6925	Standard Test Method for Preparation and Determination of the Relative Density of Hot Mix Asphalt (HMA) Specimens by Means of the SuperPave Gyratory Compactor.
ASTM D6926	Standard Practice for Preparation of Bituminous Specimens Using Marshall Apparatus
ASTM D6927	Standard Test Method for Marshall Stability and Flow of Bituminous Mixtures
ASTM D6995	Standard Test Method for Determining Field VMA based on the Maximum Specific Gravity of the Mix (Gmm)
ASTM E11	Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves
ASTM E178	Standard Practice for Dealing with Outlying Observations
ASTM E1274	Standard Test Method for Measuring Pavement Roughness Using a Profilograph

ASTM E950	Standard Test Method for Measuring the Longitudinal Profile of Traveled Surfaces with an Accelerometer Established Inertial Profiling Reference
ASTM E2133	Standard Test Method for Using a Rolling Inclinometer to Measure Longitudinal and Transverse Profiles of a Traveled Surface

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M156	Standard Specification for Requirements for Mixing Plants for Hot-Mixed, Hot-Laid Bituminous Paving Mixtures.
AASHTO T329	Standard Method of Test for Moisture Content of Hot Mix Asphalt (HMA) by Oven Method
AASHTO T324	Standard Method of Test for Hamburg Wheel-Track Testing of Compacted Asphalt Mixtures
AASHTO T 340	Standard Method of Test for Determining the Rutting Susceptibility of Hot Mix Asphalt (APA) Using the Asphalt Pavement Analyzer (APA)

Asphalt Institute (AI)

Asphalt Institute Handbook MS-26, Asphalt Binder

Asphalt Institute MS-2 Mix Design Manual, 7th Edition

AI State Binder Specification Database

Federal Highway Administration (FHWA)

Long Term Pavement Performance Binder Program

Advisory Circulars (AC)

AC 150/5320-6	Airport Pavement Design and Evaluation

FAA Orders

5300.1	Modifications to Agency Airport Design, Construction, and Equipment Standards

Software

FAARFIELD

END OF ITEM P-401

--------END OF SECTION 02401--------

SECTION 02415 – ASPHALT UNDERLAYER GEOGRID

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

The General Provision of the contract, including the General Provisions for Construction Projects (2016), Special Provisions, and General Requirements of the Specifications, apply to the work specified in this section.

1.2 DESCRIPTION OF WORK

A. This section describes furnishing transportation, labor, materials, and equipment to furnish and install geogrid stabilization of asphalt layer in the construction of roadway, or airfield pavement. Design details for geogrid stabilization, such as geogrid type, fill thickness, pavement and track cross-sections, and associated details, shall be provided by the Engineer or manufacturer's representative. Work consists of:

1. Providing supplier representative for installation by the Contractor and as directed by the Engineer.
2. Furnishing geogrids as specified in the Contract Drawings.
3. Storing, cutting, and placing geogrids compliant with and in close conformity with the lines, grades, and dimensions as directed by the Engineer.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. SECTION 02209 – CRUSHED AGGREGATE BASE COURSE

B. SECTION 02401 – ASPHALT MIX PAVEMENT

1.4 REFERENCES

A. NCHRP Synthesis 325. 2004. Significant Findings from Full-Scale Accelerated Pavement Testing.

B. NCHRP Report 51 2003. Accelerated Pavement Testing: Data Guidelines.

1.5 DEFINITIONS

A. Geogrid: A coextruded, composite polymer sheet which is then punched and oriented. The resulting structure consists of continuous and non-continuous ribs forming three aperture geometries (hexagon, trapezoid, and triangle), and an unimpeded suspended hexagon of appropriate size and shape to allow interlocking with surrounding soil, rock, or earth to function primarily as stabilization.

B. Mechanically Stabilized Asphalt Underlayer: A composite layer of a defined thickness ≥ 3-inches comprised of asphalt materials combined with one layer of underlying geogrid with apertures of appropriate size and shape to allow interlocking with the asphalt materials. The combination of the two materials creates an improved or modified composite layer with significantly improved properties and performance capabilities.

1.6 SUBMITTALS

A. Geogrid product sample, size approximately 12 inches by 12 inches or larger with the manufactures' product label.

B. Geogrid product data sheet and certification from the manufacturer of the geogrid that the geogrid product supplied meets the requirements of this section.

C. Manufacturer's installation instructions and general recommendations.

PART 2 - PRODUCTS

2.1 Materials: The underlayer geosynthetic shall be Tensar InterAx NXAC Geogrid or approved equal and have the nominal characteristics shown in the tables below:

Geogrid Nominal Characteristics

Property	General
Minimum Required Aperture Shape in Continuous Sheet	General
Rib Aspect Ratio2	Open Hexagon
Structure	≥1.0
Rib shape	Coextruded and Integrally Formed
Continuous parallel rib pitch (inch)3	Rectangular
Resistance to Chemical Degradation	3.2

Notes:
1 Unless indicated otherwise, all values in the table represent minimum average roll values (MARV) as defined in ASTM D4439.
2 Ratio of the mid-rib depth to the mid-rib width.
3 Nominal dimensions.
4 Resistance to loss of load capacity or structural integrity when subjected to 500 hours of ultraviolet light and aggressive weathering in accordance with ASTM D4355

Geotextile Nominal Characteristics

Property	General
Grab Tensile Strength1	40 lbs.
Gab Elongation2	50%
Trapezoid Tear Strength3	12 lbs.

Notes:
1 ASTM D4632
2 ASTM D4632
3 ASTM D4533

PART 3 - EXECUTION

3.1 QUALITY ASSURANCE

Schedule and conduct a pre-construction conference prior to the installation of the geogrid. Arrange a meeting at the site with the Geogrid material supplier and, where applicable, the Geogrid installer. Notify the Engineer at least 3 days in advance of the time of the meeting. A representative of the geogrid supplier shall be available on an "as needed" basis during construction or when requested by the Engineer.

3.2 DELIVERY, STORAGE, AND HANDELING

A. Prevent excessive mud, wet concrete, epoxy, or other deleterious materials from coming in contact with and affixing to the geogrid materials.

B. Store at temperatures above minus 20 degrees F (minus 29 degrees C).

C. Rolled materials may be laid flat or stood on end.

D. Geogrid materials should not be left directly exposed to sunlight for a period longer than the period recommended by the manufacturer.

3.3 CONSTRUCTION

A. Examination. Check the geogrid upon delivery to verify that the proper material has been received. Inspect the geogrid to ensure that the materials have the manufacturer’s product label, are free of flaws or damage occurring during manufacturing, shipping, or handling.

B. Preparation. Prepare aggregate base or subgrade per specification section 02209 Crushed Aggregate Base Course.

C. Installation

1. Geogrid shall be installed on the firm and unyielding subgrade surface, longitudinally along the roadway, taxiway, paving lane, etc. alignment as directed by the Engineer and any installation guidelines provided by the manufacturer.

2. Geogrid shall be properly secured to the underlying subgrade or aggregate surface. Depending on the condition of the underlying surface, as directed by the Engineer, the geogrid underlayer must be secured with the proper tack coat or

base prime coat. Apply at the rate of 0.30 to 0.60 Gals/SY depending on the subgrade surface. Install geogrid underlayer into the tack or prime coat, prior to curing, with the geogrid underlayer laying flat on subgrade surface with the leading edge secured (i.e. staples, asphalt) to subgrade.

3. Align the geogrid such that the roll length runs parallel with the main roadway taxiway, paving lane, etc.
4. Adjacent rolls of geogrid underlayer shall be placed with a butt joint (adjacent, no overlap) in the direction of paving.
5. If necessary, spread asphalt on top of geogrid underlayer to adequately accommodate paving on top of geogrid.
6. Asphalt paving shall be placed and compacted in such a manner that minimizes the development of wrinkles in the geogrid.
7. A minimum compacted asphalt thickness of 3-inches is required over geogrid, as indicated on the plans.

D. Inspection. The geogrid is subject to inspections as directed by the Engineer. Repair or replace any damaged or defective geogrid (i.e. frayed coating, separated junctions, separated layers, tears, and the like) per manufacturer's guidance.

E. Repair

1. Any rolls or areas of geogrid damaged before, during or after installation, prior to acceptance by the Engineer, shall be replaced by the Contractor at no additional cost to the owner or increase in contract time.

F. Trenching. Post-construction trenching through the geogrid shall be accomplished with conventional trenching equipment. Repairs to the trench section shall be with a new trench section equal in design strength to the adjacent pavement. If the section is repaired to match the original section, the edges of the rolls of the geogrid shall be connected with a butt joint, with no overlap required.

G. Protection. Follow the manufacturer's recommendations regarding protection from exposure to sunlight.

PART 4 - MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. The Engineer will measure the Geogrid per square yard in accordance with the contract documents.

4.2 BASIS OF PAYMENT

The Engineer will pay for the accepted Geogrid per square yard. Payment will be full compensation for the work prescribed in this section and the contract documents.

Payment will be made under:

ITEM NO.	ITEM	UNIT
02415.1	Asphalt Underlayer Geogrid	Square Yards

PART 5 - ATTACHMENTS (Not Used)

--------END OF SECTION--------

SECTION 02416– ASPHALT INTERLAYER GRID

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

The General Provision of the contract, including the General Provisions for Construction Projects (2016), Special Provisions, and General Requirements of the Specifications, apply to the work specified in this section.

1.2 DESCRIPTION OF WORK

A. This section describes furnishing transportation, labor, materials, and equipment to furnish and install fiberglass HMA reinforcement grid with integrated polymer tack film between asphalt layers in a pavement structure. Work consists of:

1. Providing supplier representative for pre-construction conference with the Contractor and the Engineer.

2. Furnishing reinforcement grids as specified in the Contract Documents.

3. Storing, cutting, and placing reinforcement grids compliant with and in close conformity with the lines, grades, and dimensions, as directed by the Engineer.

B. This work must consist of furnishing all labor, materials, and equipment and installing complete in place as directed by the Engineer.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02209 – Crushed Aggregate Base Course

B. Section 02401 – Asphalt Mix Pavement

1.4 REFERENCES

A. Asphalt Institute Handbook.

B. AASHTO Standard Specification for Highway Bridges.

C. ASTM D276: Test Method for Identification of Fibers in Textiles.

D. ASTM D4595: Test Method for Tensile Properties of Geotextiles by Wide Width Strip.

E. ASTM D4694 – Standard Test Method for Deflections with a Falling-Weight-Type Impulse Load Device.

F. ASTM D4759 – Standard Practice for Determining the Specification Conformance of Geosynthetics.

G. ASTM D5340 – Standard Test Method for Airport Pavement Condition Index Surveys.

H. ASTM D5261 – Standard Test Method for Measuring Mass per Unit Area of Geotextiles.

I. ASTM D6637: Standard Test Method for Tensile Properties of Geogrids by Single/Multi Rib Test Method (2001).

J. DIN EN ISO 10319 (2008-10) – Geosynthetics - Wide-Width Tensile Test (ISO 10319:2008).

K. FHWA – Federal Highway Administration – Design Guidelines.

1.5 DEFINITIONS

A. HMA Reinforcement Grid. A high-strength custom knitted fiberglass grid coated with a high temperature non-asphaltic elastomeric polymer and self-adhesive glue, combined with an integrated multilayer polymer tack film.
B. Integrated Tack Film (TF). A multilayer polymer film integrated on the grid designed to enhance bond between asphalt layers and, where allowed, replace conventional tack coats.

1.6 SYSTEM DESCRIPTION

A. Flexible Pavements: Provide fiberglass grid HMA reinforcement system with integrated polymer tack film installed between asphalt layers in a pavement structure to distribute the load, reinforce the pavement and reduce cracking distresses.
B. Rigid or Composite Pavements: Provide fiberglass grid HMA reinforcement system installed between freshly leveled asphalt overlay to absorb the strain and stress energy developed by traffic-induced working HMA cracks, concrete joint and slab shrinkage and expansion due to thermal changes.

1.7 SUBMITTALS

A. Catalog data and recent certification, performed at most 1 year prior to the submittal, showing that the asphalt reinforcement grid and tack coat meets the specified requirements.
B. Manufacturer's installation instructions and general recommendations.
C. Product Data: Manufacturer's data sheets on each product to be used, including preparation instructions, storage and handling requirements and recommendations.
D. Samples: enough material to prepare two samples of each type of fiberglass HMA reinforcing grid specified. Each sample shall be 305 mm by 203 mm (12 in. by 8 in.) and include a minimum of 5 ribs.
E. Certification: provide Minimum Average Roll Values (MARV), annual letter of compliance from accredited third-party testing facility, and tests used to determine those properties.
F. List of at least five comparable projects similar in size and application where results can be verified after a minimum of three years of service life.
G. Additional information as requested by the Engineer to fully evaluate the product

PART 2 – PRODUCTS

2.1 Materials: The HMA reinforcement grids Glasgrid 8511TF and 8512TF or approved equal shall consist of a high strength fiberglass grid custom knitted and coated with a high temperature non-asphaltic elastomeric polymer and self-adhesive glue. The grid is combined with a multilayer tack film designed to enhance the bond between layers of hot mix asphalt and replace conventional tack coats. The paving mat reinforcement shall conform to the properties in the table below.

Material and Strength Properties (MARV)

	PRODUCT PROPERTIES	METHOD	UNITS	GG8511TF	GG8512TF
Material Properties	Aperture Size (Center to Center)		mm (inch)	25 x 25 (1.0 x 1.0)	25 x 25 (1.0 x 1.0)
	Percent Open Area	CW-02215 MOD.[1]	%	Greater than or equal to 50	Greater than or equal to 50
	Fiberglass Coating			Elastomeric Polymer	Elastomeric Polymer
	Polymer Tack Film	Integrated on Grid	%	100	100
	Mass / Unit Area	ASTM D5261	g/m² (oz/yd²)	432 (12.7)	635 (18.5)

	Roll Width		m (ft.)	1.5 (4.9)	1.5 (4.9)
Strength Properties	Fiberglas Coating Softening Point	ASTM D36	°C (°F)	Greater than 232 (450)	Greater than 232 (450)
	Tensile Strength (MD x CD)	ASTM D6637	kN/m (lb./in)	100 x 100 (571 x 571)	100 x 200 (571 x 1,142)
	Tensile Strength @2%	ASTM D6637	kN/m (lb./in)	80 x 80 (456 x 456)	80 x 160 (456 x 913)
	Elongation at Break	ASTM D6637	(%)	Less than 3	Less than 3

[1] - Army Corp of Engineers test method correlated to light emitted through fabric.

Product Performance Requirements

	TEST DESCRIPTION	TEST METHOD	METHOD OF MEASURE	PERFORMANCE
Performance Requirements	Coating Softening Temperature vs. HMA Asphalt Binder Compaction Temperature	Temperature Comparison	Job Mix Formula Compaction Temperature Requirement	Coating Softening Point > HMA Compaction Temperature
	Field Millability and Recyclability Validation	Field Milling of Asphalt with GlasGrid	References or Reports	Documented Experience
	Asphalt: Grid composite stiffness for durability of composite layers over life of pavement during individual and long term deformation	3Pt Beam Test at 70°F, Grid with polymer tack at mid depth relative to a control with polymer tack film – cyclic stress controlled Haversquare loading	Minimum Improvement Factor vs. Control	> 5x
	Fatigue and Reflective Cracking	MMLS3 Scaled APT[1] Testing vs. Control	Fatigue and Reflective Cracking Testing	> 3x
	Full Scale Plate Load Testing	Plate Load Testing vs. Control	Pavement Composite Modulus	> 2x

[1] : APT – Accelerated Pavement Testing

PART 3 – EXECUTION

3.1 QUALITY ASSURANCE.

Manufacturer Qualifications: manufacturer with at least 20 years of documented experience in the manufacture and installation of fiberglass HMA reinforcing grids, and documented evidence of an established quality control program; annual conformance testing performed by an accredited third-party testing facility.

Installer Qualifications: firm with documented experience in the installation of fiberglass HMA reinforcement grid systems with integrated tack film, with at least two projects of similar construction and scope.

Pre-Construction Meeting: conduct a virtual or in person meeting at the site with the materials supplier, the installer, and the Contractor to review the preparation and installation requirements; notify the Engineer at least 3 days in advance of the time of the meeting.

3.2 DELIVERY, STORAGE, AND HANDLING.

A. Store products in manufacturer's unopened packaging until ready for installation.
B. Store in a dry, covered location free of dust, dirt, and moisture. Prevent excessive mud, fluid concrete, asphalt, or other deleterious materials from coming in contact with reinforcement grid materials.
C. Store at temperatures above -29°C (-20°F) and below 75°C (167°F) and maximum relative humidity of 85%.

3.3 PROJECT CONDITIONS.

A. Do not place reinforcement when the asphalt surface is wet, or contaminated with oil, soil or excessive dust.
B. Do not place asphalt during wet or freezing weather that prevents conformance with specified requirements.
C. Do not install asphalt on the reinforcement when the underlying asphalt surface is cooler than 10°C (50°F), warmer than 60°C (140°F), or in the case of new asphalt, prior to the asphalt cooling to 43°C (110°F) at least once previously.

3.4 CONSTRUCTION

A. Surface Preparation

1. Do not begin reinforcing system installation until existing pavement conditions have been evaluated and all repairs have been completed.

2. Seal cracks greater than 6 mm (1/4 in.) with an acceptable crack filler. Repair wider cracks using a method that provides a level surface. All holes shall be filled with hot asphalt and compacted level with adjacent surfaces.

3. Surfaces shall be mechanically cleaned by sweeping and vacuuming and be free of oil, vegetation, sand, dirt, water, gravel, and other contaminants prior to placement of reinforcement grid.

B. Installation

1. Prior to use, store reinforcement grid rolls in unopened packaging vertically (on end) under dry, covered conditions free from dust, dirt, and moisture to prevent roll distortion and contamination.

2. Install reinforcement grid system in accordance with manufacturer's installation guidelines.

3. Surface temperature shall be between 10°C (50°F) and 60°C (140°F) prior to placing the reinforcement grid, and the placement surface must be dry.

4. Lap transverse joints in the direction of paving 76 mm to 152 mm (3–6 in.); longitudinal joints shall be overlapped 25 mm to 50 mm (1–2 in.) or as recommended by the manufacturer, whichever is greater.

5. After placement, activate self-adhesive glue by rolling with a rubber coated drum roller or a pneumatic tire roller until proper adherence occurs. In no instance shall steel-wheeled or vibratory rollers be used.

C. Asphalt Placement

1. Place the asphalt overlay course the same day the reinforcement grid is placed.

2. Overlay course shall be a minimum compacted thickness of 40 mm (1-1/2 in.).

3. To activate the tack film, the surface temperature must be 21°C (70°F) and the asphalt mix being placed over the reinforcement grid must be placed at a minimum temperature of 140°C (285°F).

D. Field Quality Control

1. Perform adhesion tests: a 9 kg (20 lb) pull is required without pulling the grid free or creating ripples.

2. Frequency: provide a minimum of one adhesion test per 300 m² (3,000 sq. ft.) of surface area.

PART 4 – MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. The Engineer will measure the HMA Reinforcement Grid per square yard in accordance with the Contract Documents.

4.2 BASIS OF PAYMENT

The Engineer will pay for the accepted HMA Reinforcement Grid per square yard. Payment will be full compensation for the work prescribed in this section and the Contract Documents.

Payment will be made under:

ITEM NO.	ITEM	UNIT
02416.1	Asphalt Interlayer Grid (GG 8511TF)	Square Yard
02416.2	Asphalt Interlayer Grid (GG 8512TF)	Square Yard

PART 5 – ATTACHMENTS (Not Used)

-----END OF SECTION-----

SECTION 02417– RAPID REPAIR ASPHALT INTERLAYER GRID

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

The General Provision of the contract, including the General Provisions for Construction Projects (2016), Special Provisions, and General Requirements of the Specifications, apply to the work specified in this section.

1.2 DESCRIPTION OF WORK

A. This section shall include the application of a strain relieving and waterproofing composite asphalt reinforcement comprised of a self-adhering polymer modified bitumen layer (peel and stick) and a 100 kN high temperature elastomeric polymer coated pavement reinforcement grid. A release film, which is removed prior to placement, covers the self-adhesive mastic. This work must consist of furnishing all labor, materials, and equipment and installing complete in place as directed by the Engineer.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02209 – Crushed Aggregate Base Course

B. Section 02401 – Asphalt Mix Pavement

1.4 REFERENCES

A. ASTM D36: Standard Test Method for Softening Point of Bitumen.

B. ASTM D123: Standard Terminology Relating to Textiles.

C. ASTM D276: Test Method for Identification of Fibers in Textiles.

D. ASTM D1777: Standard Test Method for Thickness of Textile Materials.

E. ASTM D4595: Test Method for Tensile Properties of Geotextiles by Wide Width Strip.

F. ASTM D4439: Terminology for Geotextiles.

G. ASTM D6637: Standard Test Method for Tensile Properties of Geogrids by Single/Multi Rib Test Method (2001).

H. ASTM D5261: Standard Test Method for Measuring Mass per Unit Area of Geotextiles.

I. ASTM D6241: Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile Related Products.

J. ASTM D4694: Standard Test Method for Deflections with a Falling-Weight-Type Impulse Load Device.

K. ASTM D4759: Standard Practice for Determining the Specification Conformance of Geosynthetics.

L. ASTM C338: Standard Test Method for Melt Point of Bitumen.

M. FHWA – Federal Highway Administration – Design Guidelines.

1.5 DEFINITIONS

A. Minimum Average Roll Value (MARV)
Property value calculated as typical minus two standard deviations. Statistically, it yields a 97.7 percent degree of confidence that any sample taken during quality assurance testing will exceed value reported.

1.6 SUBMITTALS

A. Certification: The Contractor shall provide to the Engineer a certificate stating the name of the manufacturer, product name, style number, chemical composition of the filaments or yarns and other pertinent information to fully describe the product.

PART 2 – PRODUCTS

2.1 Materials: PG 100 Paving Grid or approved equal is a strain relieving, increased traffic capacity and waterproofing low elongating reinforcing grid comprised of a self-adhering polymer modified bitumen mastic layer (peel and stick) and a 100 kN (571 lbs) tensile fiberglass, high temperature elastomeric polymer coated pavement reinforcing grid. A release film, removed prior to placement, covers the self-adhesive mastic layer. The paving grid shall conform to the properties in the table below.

PAVING GRID REINFORCEMENT (PHYSICAL PROPERTIES)

Property	Test Method	Units	MARV*
Tensile strength (min)*	ASTM D4595	kN/m / lbs/in	100 x 100 / 571 x 571

Tensile elongation (max)*	ASTM D4595	Percent	< 3
Mass per unit area	ASTM D5261-92	g/m² / oz/yd²	1,450 / 51
Polymer Modified Adhesive	ASTM C338	°C / °F	> 93°C / > 193°F

*Testing performed on the mat only.

Material and Strength Properties

PRODUCT PROPERTIES	METHOD	UNITS	MARV
Aperture Size (Center to Center)		mm / inch	25 x 25 / 1 x 1
Percent Open Area	CW-02215 MOD.[1]	%	> 50
Fiberglass Coating			Elastomeric Polymer
Mass / Unit Area	ASTM D5261	g/m² / oz/yd²	405 / 12.0
Roll Width		m / ft	1.5 / 5.0
Fiberglass Coating Softening Point	ASTM D36	°C / °F	> 232 / 450
Tensile Strength (MD x CD)	ASTM D6637	kN/m / lb./in	100 x 100 / 571 x 571
Tensile Strength @2%	ASTM D6637	kN/m / lb./in	80 x 80 / 456 x 456
Elongation at Break	ASTM D6637	%	< 3
			[1] - Army Corp of Engineers test method correlated to light emitted through fabric.

APT – Accelerated Pavement Testing

PART 3 – EXECUTION

3.1 QUALITY ASSURANCE.

Pre-Construction Meeting: Prior to the installation of the reinforcement, the Contractor shall arrange a meeting at the site with the manufacturer/supplier's representative and, where applicable, the installer. The Engineer shall be notified at least 3 days in advance of the time of the meeting.

A manufacturer's representative shall be present, at minimum, for the first day of installation of the reinforcement and available thereafter upon request by the Engineer.

3.2 DELIVERY, STORAGE, AND HANDLING.

Product labeling, shipment, and storage shall follow ASTM D4873. Product labels shall clearly show the manufacturer or supplier name, style name, and roll number.

During storage, the product rolls shall be elevated off the ground and adequately covered to protect them from handling, rain, extended UV radiation including sunlight, chemicals that are highly acidic or alkaline, high temperatures, and any other environmental conditions that may damage the physical property values of the product.

3.3 QUALITY CONTROL

Manufacturing Quality Control: Testing shall be performed at an accredited laboratory.

Manufacturer's certifications and testing of quality assurance samples obtained using Procedure B of ASTM D4354. A lot size for conformance or quality assurance sampling shall be the shipment quantity of the given product or a truckload of the given product, whichever is smaller.

3.4 CONSTRUCTION

A. Surface Preparation

1. The surface on which the peel and stick pavement reinforcing mat is to be placed shall be reasonably free of dirt, water, vegetation or other debris.

2. The Rapid Repair PG 100 peel and stick pavement reinforcing grid shall be placed on a primed drainable surface, and any rutting or low spots in the pavement shall be removed by milling or by the use of a leveling course.

3. Active cracks exceeding 1/4 inch in width shall be filled with suitable crack filler. Potholes shall be properly repaired as directed by the Engineer. Fillers shall be allowed to cure prior to placement of the engineered pavement reinforcing grid.

4. Neither the primer or asphalt tack coat nor the peel and stick pavement reinforcing mat shall be placed when weather conditions, in the judgment of the Engineer, are not suitable. The air temperature shall be 50°F and rising for placement of the asphalt tack coat.

B. Primer/Tack Application (if specified)

1. Application of a primer or tack coat, if specified, shall be by any method, but should provide full coverage to promote adhesion of the peel and stick pavement reinforcing mat. The primer or tack coat should be uniformly applied with no pooling or bare streaks.

2. The primer or tack coat application, if specified, shall be wide enough to cover the entire width of peel and stick pavement reinforcing gird material.

3. The primer or tack coat shall be applied only as far in advance of the reinforcement installation as is appropriate to ensure a tacky surface at the time of placement.

C. Grid Placement

1. Place the Rapid Repair PG 100 peel and stick pavement reinforcement grid onto the primer or tack coat with minimum folds or wrinkles and before the primer or tack coat has cooled and lost tackiness. As directed by the Engineer, wrinkles or folds in excess of 1 inch shall be slit and laid flat or pulled out and replaced. In these repaired areas, additional primer or tack coat shall be applied as needed to achieve a sound bond to the substrate.

2. Damaged peel and stick paving grid shall be removed and replaced, per the manufacturer's recommendations, at the Contractor's expense with the same reinforcement material.

3. Brooms or squeegees shall be used to remove any air bubbles and to maximize the grid’s contact with the pavement surface and shall be done in accordance with the manufacturer's specifications and to the satisfaction of the Engineer.

4. No traffic, except necessary construction traffic or emergency vehicles, shall be driven on the installed reinforcement mat unless approved by the Engineer. If traffic is approved, clean sand shall be lightly broadcasted over the mat before trafficking, and any loose sand shall be removed prior to paving.

D. Asphalt Overlay

1. The final coat of tack coat shall be placed prior to paving and allowed to break and cure. If the Contractor chooses to do so, and with the agreement of the Engineer, the reinforcement grid can be installed into the full-width applied tack coat as long as the tack coat is allowed to break and cure.

2. Placement of the first lift of the HMA overlay shall closely follow placement of the reinforcement grid. On active roadways, all areas where the grid has been placed shall be paved during the same day unless approved otherwise by the Engineer. If rainfall occurs on the grid prior to the first overlay lift, allow the grid to dry before HMA placement.

3. The compacted thickness of the first lift of the HMA overlay on the reinforcement grid shall not be less than 1.5 inches. Where the total HMA overlay thickness is expected to be less than 1.5 inches, reinforcement grid shall not be placed.

PART 4 – MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. The Engineer will measure the PG 100 reinforcement grid by the square yard (or square meter as indicated in the Contract Documents) including wastage.

4.2 BASIS OF PAYMENT

The Engineer will pay for the accepted PG 100 reinforcement grid by the square yard (or square meter as indicated in the Contract Documents) installed.

Payment will be made under:

ITEM NO.	ITEM	UNIT
02417.1	Rapid Repair Asphalt Interlayer Grid	Square Yard

PART 5 – ATTACHMENTS (Not Used)

-----END OF SECTION-----

SECTION 02418 – RAPID REPAIR ASPHALT INTERLAYER PAVING MAT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

The General Provision of the contract, including the General Provisions for Construction Projects (2016), Special Provisions, and General Requirements of the Specifications, apply to the work specified in this section.

1.2 DESCRIPTION OF WORK

A. This section shall include the application of a strain relieving and waterproofing composite asphalt reinforcement comprised of a self-adhering polymer modified bitumen layer (peel and stick) and a 25 kN high temperature elastomeric polymer coated pavement reinforcement mat. A release film, which is removed prior to placement, covers the self-adhesive mastic. This work must consist of furnishing all labor, materials, and equipment and installing complete in place as required in the Contract Documents.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02209 – Crushed Aggregate Base Course

B. Section 02401 – Asphalt Mix Pavement

1.4 REFERENCES

A. ASTM D36: Standard Test Method for Softening Point of Bitumen.

B. ASTM C338: Standard Test Method for Melting Point of Bitumen.

C. ASTM D123: Standard Terminology Relating to Textiles.

D. ASTM D276: Test Method for Identification of Fibers in Textiles.

E. ASTM D1777: Standard Test Method for Thickness of Textile Materials.

F. ASTM D4354: Practice for Sampling of Geosynthetics for Testing.

G. ASTM D4439: Terminology for Geotextiles.

H. ASTM D5035: Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method).

I. ASTM D5261: Standard Test Method for Measuring Mass per Unit Area of Geotextiles.

J. ASTM D6241: Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile Related Products.

K. ASTM D5084: Standard Test Method for Measurement of Hydraulic Conductivity of Saturated Porous Materials.

1.5 DEFINITIONS

A. Minimum Average Roll Value (MARV)
Property value calculated as typical minus two standard deviations. Statistically, it yields a 97.7 percent degree of confidence that any sample taken during quality assurance testing will exceed value reported.

1.6 SUBMITTALS

A. Certification: The Contractor shall provide to the Engineer a certificate stating the name of the manufacturer, product name, style number, chemical composition of the filaments or yarns and other pertinent information to fully describe the product.

PART 2 – PRODUCTS

2.1 Materials: PG25 or approved equal is a strain relieving and waterproofing low elongating reinforcing mat comprised of a self-adhering polymer modified bitumen mastic layer (peel and stick) and a 25 kN tensile fiberglass, high temperature elastomeric polymer coated pavement reinforcing mat. A release film, which is removed prior to placement, covers the self-adhesive mastic layer. The paving mat reinforcement shall conform to the properties in the following tables.

PEEL AND STICK PAVING MAT REINFORCEMENT (PHYSICAL PROPERTIES)

Property	Test Method	Units	MARV*
Tensile strength (min)*	ASTM D4595	kN/m / lbs/in	25 x 25 / 286 x 286
Tensile elongation (max)*	ASTM D4595	Percent	< 3
Mass per unit area	ASTM D5261-92	g/m² / oz/yd²	1,187 / 35
Bitumen melting point (min)	ASTM C338	°C / °F	93 / 199
Fiberglass coating softening	ASTM D36	°C / °F	> 149 / 300

*Testing performed on the mat only.

Installed in HMA Performance Requirements

TEST DESCRIPTION	TEST METHOD	METHOD OF MEASURE	PERFORMANCE
Stress Improvement Factor	TTI Overlay Tester	Vs. Control	≥ 3.2
Permeability	ASTM D5084	cm/sec	≥ 2.6 x 10^-11
Elastomeric Polymer Coated Fiberglass	Temperature Comparison	Softening Point	> Compaction Temp
Recyclability without screening	AASHTO T283-07	Moisture/Rutting Susceptibility	Pass
Recyclability without screening	AASHTO T322-07	Low Temp. Cracking	Pass

PART 3 – EXECUTION

3.1 QUALITY ASSURANCE.

Pre-Construction Meeting: Prior to the installation of the reinforcement, the Contractor shall arrange a virtual or in person meeting at the site with the manufacturer/supplier's representative and, where applicable, the installer. The Engineer shall be notified at least 3 days in advance of the time of the meeting.

A manufacturer's representative shall be present, at minimum, for the first day of installation of the reinforcement and available thereafter upon request by the Engineer.

3.2 DELIVERY, STORAGE, AND HANDLING.

Product labeling, shipment, and storage shall follow ASTM D4873. Product labels shall clearly show the manufacturer or supplier name, style name, and roll number.

During storage, the product rolls shall be elevated off the ground and adequately covered to protect them from handling, rain, extended UV radiation including sunlight, chemicals that are highly acidic or alkaline, high temperatures, and any other environmental conditions that may damage the physical property values of the product.

3.3 QUALITY CONTROL

Manufacturing Quality Control: Testing shall be performed at an accredited laboratory.

Manufacturer's certifications and testing of quality assurance samples obtained using Procedure B of ASTM D4354. A lot size for conformance or quality

assurance sampling shall be the shipment quantity of the given product or a truckload of the given product, whichever is smaller.

3.4 CONSTRUCTION

A. Surface Preparation

1. The surface on which the peel and stick pavement reinforcing mat is to be placed shall be reasonably free of dirt, water, vegetation or other debris.

2. The peel and stick pavement reinforcing mat shall be placed on a primed drainable surface, and any rutting or low spots in the pavement shall be removed by milling or by the use of a leveling course as shown on the plans.

3. Active cracks exceeding 1/4 inch in width shall be filled with suitable crack filler. Potholes shall be properly repaired as directed by the Engineer. Fillers shall be allowed to cure prior to placement of the engineered pavement reinforcing mat.

4. Neither the primer or asphalt tack coat nor the peel and stick pavement reinforcing mat shall be placed when weather conditions, in the judgment of the Engineer, are not suitable. The air temperature shall be 50°F and rising for placement of the asphalt tack coat.

B. Primer/Tack Application (if specified)

1. Application of a primer or tack coat, if specified, shall be by any method, but should provide full coverage to promote adhesion of the peel and stick pavement reinforcing mat. The primer or tack coat should be uniformly applied with no pooling or bare streaks.

2. The primer or tack coat application, if specified, shall be wide enough to cover the entire width of peel and stick pavement reinforcing mat material.

3. The primer or tack coat shall be applied only as far in advance of the reinforcement installation as is appropriate to ensure a tacky surface at the time of placement.

C. Mat Placement

1. The peel and stick pavement reinforcement mat shall be placed onto the primer or tack coat with minimum folds or wrinkles and before the primer or tack coat has cooled and lost tackiness. As directed by the Engineer, wrinkles or folds in excess of 1 inch shall be slit and laid flat or pulled out

and replaced. In these repaired areas, additional primer or tack coat shall be applied as needed to achieve a sound bond to the substrate.

2. Damaged peel and stick paving mat shall be removed and replaced, per the manufacturer's recommendations, at the Contractor's expense with the same reinforcement material.

3. Brooms or squeegees shall be used to remove any air bubbles and to maximize the mat's contact with the pavement surface and shall be done in accordance with the manufacturer's specifications and to the satisfaction of the Engineer.

4. No traffic, except necessary construction traffic or emergency vehicles, shall be driven on the installed reinforcement mat unless approved by the Engineer. If traffic is approved, clean sand shall be lightly broadcasted over the mat before trafficking, and any loose sand shall be removed prior to paving.

D. Asphalt Overlay

1. The final coat of tack coat shall be placed prior to paving and allowed to break and cure. If the Contractor chooses to do so, and with the agreement of the Engineer, the peel and stick pavement reinforcement mat can be installed into the full width applied tack coat as long as the tack coat is allowed to break and cure.

2. Placement of the first lift of the HMA overlay shall closely follow placement of the peel and stick pavement reinforcement mat. On active roadways, all areas in which the peel and stick paving mat has been placed shall be paved during the same day unless approved otherwise by the Engineer. In the event of rainfall on the mat prior to the first HMA overlay lift, the mat shall be allowed to dry before the HMA is placed.

3. The compacted thickness of the first lift of the HMA overlay on the peel and stick paving mat shall not be less than 1.5 inches. Where the total HMA overlay thickness is expected to be less than 1.5 inches, peel and stick pavement reinforcing mat shall not be placed.

PART 4 – MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. The Engineer will measure the peel and stick pavement reinforcement mat by the square yard (or square meter as indicated in the Contract Documents) including wastage.

4.2 BASIS OF PAYMENT

Payment shall be made at the contract unit price for the unit of measurement specified above. This price shall be full compensation for furnishing all materials and for all preparation, hauling, stockpiling, disposal and placing of material, and for all labor, equipment, tools, and incidentals necessary to complete this work.

Payment will be made under:

ITEM NO.	ITEM	UNIT
02418.1	Rapid Repair Asphalt Interlayer Paving Mat	Square Yard

PART 5 – ATTACHMENTS (Not Used)

-----END OF SECTION-----

SECTION 02562 – SURFACE PREPARATION AND CRACK SEALING

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

The General Provision of the contract, including the General Provisions for Construction Projects (2016), Special Provisions, and General Requirements of the Specifications, apply to the work specified in this section. This Section is based on the FAA AC 150/5370-10H Specification P-101 – Surface Preparation.

1.2 DESCRIPTION OF WORK

This item shall consist of:

A. Removal of existing asphalt pavement either full depth or to a depth specified by the Engineer.

B. Application of a water-based herbicide to runway and taxiway asphalt pavement cracks at locations specified by the Engineer.

C. Preparation, routing and cleaning of asphalt pavement cracks between 1/8" and 1-1/2" wide and application of an asphalt and aggregate mixture crack filler in areas as directed by the Engineer.

PART 2 – PRODUCTS

2.1 MATERIAL REQUIREMENTS

The following material requirements apply to this Section:

ASTM D6690 - Standard Specification For Joint And Crack Sealants, Hot Applied, For Concrete And Asphalt Pavements

2.2 MILLING MACHINE

Areas designated for asphalt patching shall be cold milled with equipment meeting the following requirements:

A. All equipment shall be as specified hereinafter or as approved by the Engineer. The equipment shall not cause damage to the pavement to remain in place.

B. The machine shall be capable of cutting a vertical edge without chipping or spalling the edges of the pavement to remain. The machine shall have a positive method of

controlling the depth of cut.

C. The machine shall be able to operate at speeds from five (5) to fifty (50) feet per minute, power-operated, self-propelled type with non-pneumatic tires, and capable of spraying water at cutting drum to minimize dust while maintaining enclosed cutting area.

D. The Contractor shall select the machine designed and built for asphalt pavements without addition of heat, and ability to mill Portland cement concrete patches in asphalt concrete pavement.

E. The machine shall mill without tearing or gouging the underlying surface and be capable of discharging the milling in a truck or leaving them in a defined windrow.

F. The machine includes a cutting drum totally enclosed in a shroud to prevent discharge of loose material into adjacent work area.

G. The Contractor shall select the machine so that the operator can observe the work without leaving the control area.

H. The machine shall be adjustable for slope and depth, capable of accurately controlling profile grades and cross slopes within tolerance of plus or minus one-quarter inch (±1/4").

I. The machine shall be able to cut the existing asphalt concrete pavement to determine grade on one pass.

2.3 CRACK SEALANT

A. Crack sealant shall be a hot applied, emulsified asphalt crack sealer meeting the requirements of ASTM D6690, Standard Specification for Joint and Crack Sealants, Hot Applied, For Concrete and Asphalt Pavements. Sealant material must be submitted for approval prior to placement.

B. Sealant shall be applied with a double-boiler type melter applicator that is specifically designed for and shall be capable of heating and applying all grades of asphalt rubber sealant, fiber modified asphalt sealant and specification joint sealant without any further equipment modification. The machine shall be capable of starting at ambient temperature and bringing the sealant material up to application temperature in one hour at 70° F ambient temperature. The melter shall have continuous sealant agitation and a mixing system to provide uniform viscosity and temperature of material being applied.

PART 3 – EXECUTION

3.1 REMOVAL OF EXISTING ASPHALT PAVEMENT

The Contractor's removal operation shall be controlled to not damage adjacent pavement structure, and base material, cables, utility ducts, pipelines, or drainage structures which are to remain under the pavement. Asphalt concrete pavement to be removed shall be cut to the full depth of the asphalt pavement around the perimeter of the area to be removed. The pavement shall be removed so the joint for each layer of pavement replacement is offset 1 foot from the joint in the preceding layer. This does not apply if the removed pavement is to be replaced with concrete or soil. The Contractor shall dispose of the asphalt concrete pavement debris off airport property.

3.2 HERBICIDING

A concentrated water-based herbicide solution shall be applied to asphalt pavement cracks within the areas approved by the Engineer. The herbicide shall be applied according to the manufacturer's recommendations and in a manner that concentrates the spray on the cracks and minimizes broadcast onto adjacent areas. Crack preparation, cleaning, and sealing may not begin until four (4) weeks after application of herbicide.

3.3 PREPARATION OF CRACKS

Remove all vegetation and debris from cracks to a minimum depth of 1 inch. If extensive vegetation exists treat the specific area with a concentrated solution of a water-based herbicide approved by the Engineer. Fill all cracks, ignoring hairline cracks (< 1/4 inch wide) with a crack sealant per ASTM D6690.

Wider cracks (over 1-1/2 inch wide), along with soft or sunken spots, indicate that the pavement or the pavement base should be repaired or replaced as stated below. Any excess joint or crack sealer on the surface of the pavement shall also be removed from the pavement surface. Cracks shall be filled with a Hot-Applied Asphalt Aggregate-Filled Mastic, per ASTM D8260-20.

The Hot-Applied Asphalt Aggregate-Filled Mastic material shall be poured or placed into the joints or cracks and compacted to form a voidless mass. The joint or crack shall be filled within 0 to 1/8 inches of the surface. Any material spilled outside the width of the joint shall be removed from the pavement surface. Overbanding of crack sealant shall not be permitted.

3.4 ASPHALT PAVEMENT REPAIR

The failed areas shall be removed as specified in paragraph 3.1. All failed material including surface, base course, subbase course, and subgrade shall be removed. The base course and subbase shall be replaced if it has been infiltrated with clay, silt, or other

material affecting the load-bearing capacity. Materials and methods of construction shall comply with the other applicable sections of this specification.

3.5 COLD MILLING

Milling shall be performed with a power-operated milling machine or grinder, capable of producing a finished surface that provides a good bond to the new overlay. The milling machine or grinder shall operate without tearing or gouging the under lying surface. The milling machine or grinder shall be equipped with automatic grade and slope controls. All millings shall be removed and disposed off Airport property, unless otherwise specified. If the Contractor mills or grinds deeper or wider than the plans specify, the Contractor shall replace the material that was removed with new material at no additional cost to the Owner. Milling machine shall meet the requirement of Paragraph 2.2.

The Contractor shall sweep the milled surface daily and immediately after the milling until all residual aggregate and fines are removed from the pavement surface. Prior to paving, the Contractor shall wet down the milled pavement and thoroughly sweep and/or blow the surface to remove any remaining aggregate or fines.

3.6 PREPARATION OF ASPHALT PAVEMENT SURFACES

Existing asphalt pavements indicated to be treated with a surface treatment shall be prepared as follows:

A. Patch asphalt pavement surfaces that have been softened by petroleum derivatives or have failed due to any other cause. Remove damaged pavement to the full depth of the damage and replace with new asphalt concrete similar to that of the existing pavement in accordance with paragraph 3.4.

B. Repair joints and cracks in accordance with paragraph 3.3.

C. Remove oil or grease that has not penetrated the asphalt pavement by scraping or by scrubbing with a detergent, then wash thoroughly with clean water. After cleaning, treat these areas with an oil spot primer.

D. Clean pavement surface immediately prior to placing the surface treatment by sweeping, flushing well with water leaving no standing water, or a combination of both, so that it is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film.

3.7 PREPARATION OF CRACKS IN FLEXIBLE PAVEMENT

A. Preparation of Cracks - Widen cracks with router or random crack saw by removing a minimum of 1/16 inch from each side of crack. Immediately before sealing, joints will be blown out with a hot air lance combined with oil and water-free compressed

air.

B. Removal of Existing Sealant - Existing sealants will be removed by routing or random crack saw. Following routing or sawing any remaining debris will be removed by use of a hot lance combined with oil and water-free compressed air.

PART 4 – MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Application of herbicide to pavement cracks shall be the number of linear feet of cracks to which herbicide is applied and accepted by the Engineer.

B. Crack sealing shall be measured by the linear feet of cracks routed or sawed, cleaned, and sealed and accepted by the Engineer.

C. Pavement removal shall be measured by the cubic yards of pavement removed.

4.2 BASIS OF PAYMENT

Payment shall be made at the contract unit price for the unit of measurement specified above. This price shall be full compensation for furnishing all materials and for all preparation, hauling, stockpiling, disposal and placing of material, and for all labor, equipment, tools, and incidentals necessary to complete this work.

Payment will be made under:

ITEM NO.	ITEM	UNIT
02562.1	Herbiciding	Linear Foot
02562.2	Crack Sealing	Linear Foot
02562.3	Pavement Removal	Cubic Yard

PART 5 – ATTACHMENTS (Not Used)

-----END OF SECTION-----

SECTION 02602 - EMULSIFIED ASPHALT PRIME COAT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The General Provision of the contract, including the General Provisions for Construction Projects (2016), Special Provisions, and General Requirements of the Specifications, apply to the work specified in this section. This Section shall be in accordance with FAA Specification Item P-602: Emulsified Asphalt Prime Coat, as included as an attachment to this Section.

1.2 DESCRIPTION OF WORK

A. This Section shall consist of an application of emulsified asphalt material on the prepared base course in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02401 – Asphalt Mix Pavement; FAA Specification Item P-401.

B. Section 02209 – Crushed Aggregate Base Course; FAA Specification Item P-209.

1.4 REFERENCES

A. Federal Aviation Administration (FAA)

1. FAA Specification Item P-602: Emulsified Asphalt Prime Coat.

1.5 SUBMITTALS

A. Submit in accordance with Section 01300 – Submittals.

B. Manufacturer's Certificate of Analysis for the emulsified asphalt material shall be submitted in accordance with FAA Specification Item P-602, paragraph 602-2.1.

C. Asphalt Distributor Calibration Certificate shall be submitted in accordance with FAA Specification Item P-602, paragraph 602-3.2.

D. Asphalt material and application rate shall be submitted in accordance with FAA Specification Item P-602, paragraph 602-3.3.

E. Waybills and delivery tickets shall be submitted in accordance with FAA Specification Item P-602, paragraph 602-3.5.

PART 2 - PRODUCTS

2.1 Emulsified asphalt material: in accordance with FAA Specification Item P-602, paragraph 602-2.1.

PART 3 - EXECUTION

3.1 Construction methods shall be in accordance with FAA Specification Item P-602.

PART 4 - MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Method of measurement and payment shall be in accordance with FAA Specification Item P-602, paragraph 602-4.1.

4.2 BASIS FOR PAYMENT

A. Basis for payment shall be in accordance with FAA Specification Item P-602, paragraph 602-5.1.

PART 5 - ATTACHMENTS

5.1 FAA Specification Item P-602 Emulsified Asphalt Prime Coat.

Item P-602 Emulsified Asphalt Prime Coat

DESCRIPTION

602-1.1 This item shall consist of an application of emulsified asphalt material on the prepared base course in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

602-2.1 Emulsified Asphalt material. The emulsified asphalt material shall be as specified in ASTM D3628 for use as a prime coat appropriate to local conditions. The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the emulsified asphalt material. The COA shall be provided to and approved by the Resident Project Representative (RPR) before the emulsified asphalt material is applied. The furnishing of the COA for the emulsified asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

CONSTRUCTION METHODS

602-3.1 Weather limitations. The emulsified asphalt prime coat shall be applied only when the existing surface is dry; the atmospheric temperature is 50°F (10°C) or above, and the temperature has not been below 35°F (2°C) for the 12 hours prior to application; and when the weather is not foggy or rainy. The temperature requirements may be waived when directed by the RPR.

602-3.2 Equipment. The equipment shall include a self-powered pressure asphalt material distributor and equipment for heating asphalt material.

Provide a distributor with pneumatic tires of such size and number that the load produced on the base surface does not exceed 65.0 psi (4.5 kg/sq cm) of tire width to prevent rutting, shoving or otherwise damaging the base, surface or other layers in the pavement structure. Design and equip the distributor to spray the asphalt material in a uniform coverage at the specified temperature, at readily determined and controlled rates from 0.05 to 1.0 gallons per square yard (0.23 to 4.5 L/square meter), with a pressure range of 25 to 75 psi (172.4 to 517.1 kPa) and with an allowable variation from the specified rate of not more than ±5%, and at variable widths. Include with the distributor equipment a separate power unit for the bitumen pump, full-circulation spray bars, tachometer, pressure gauges, volume-measuring devices, adequate heaters for heating of materials to the proper application temperature, a thermometer for reading the temperature of tank contents, and a hand hose attachment suitable for applying asphalt material manually to areas inaccessible to the distributor. Equip the distributor to circulate and agitate the asphalt material during the heating process. If the distributor is not equipped with an operable quick shutoff valve, the prime operations shall be started and stopped on building paper.

A power broom and power blower suitable for cleaning the surfaces to which the asphalt coat is to be applied shall be provided.

Asphalt distributors must be calibrated annually in accordance with ASTM D2995. The Contractor must furnish a current calibration certification for the asphalt distributor truck from any State or other agency as approved by the RPR.

602-3.3 Application of emulsified asphalt material. Immediately before applying the prime coat, the full width of the surface to be primed shall be swept with a power broom to remove all loose dirt and other objectionable material.

The asphalt emulsion material shall be uniformly applied with an asphalt distributor at the rate of 0.15 to 0.30 gallons per square yard (0.68 to 1.36 liters per square meter) depending on the base course surface texture. The type of asphalt material and application rate shall be approved by the RPR prior to application.

Following application of the emulsified asphalt material and prior to application of the succeeding layer of pavement, allow the asphalt coat to cure and to obtain evaporation of any volatiles or moisture. Maintain the coated surface until the succeeding layer of pavement is placed, by protecting the surface against damage and by repairing and recoating deficient areas. Allow the prime coat to cure without being disturbed for a period of at least 48 hours or longer, as may be necessary to attain penetration into the treated course. Furnish and spread sand to effectively blot up and cure excess asphalt material. The Contractor shall remove blotting sand prior to asphalt concrete lay down operations at no additional expense to the Owner. Keep traffic off surfaces freshly treated with asphalt material. Provide sufficient warning signs and barricades so that traffic will not travel over freshly treated surfaces.

602-3.4 Trial application rates. The Contractor shall apply a minimum of three lengths of at least 100 feet (30 m) for the full width of the distributor bar to evaluate the amount of emulsified asphalt material that can be satisfactorily applied with the equipment. Apply three different application rates of emulsified asphalt materials within the application range specified in paragraph 602-3.3. Other trial applications can be made using various amounts of material as directed by the RPR. The trial application is to demonstrate the equipment can uniformly apply the emulsified asphalt material within the rates specified and determine the application rate for the project.

602-3.5 Freight and waybills. The Contractor shall submit waybills and delivery tickets during the progress of the work. Before the final estimate is allowed, file with the RPR certified waybills and certified delivery tickets for all emulsified asphalt materials used in the construction of the pavement covered by the contract. Do not remove emulsified asphalt material from storage until the initial outage and temperature measurements have been taken. The delivery or storage units will not be released until the final outage has been taken.

BASIS OF MEASUREMENT AND PAYMENT

602-4.1 The emulsified asphalt material for prime coat will not be measured and paid for separately but shall be considered incidental to and included in the bid prices for 02401 - Asphalt Mix Pavement.

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM D2995	Standard Practice for Estimating Application Rate and Residual Application Rate of Bituminous Distributors
ASTM D3628	Standard Practice for Selection and Use of Emulsified Asphalts

END OF ITEM P-602

--------END OF SECTION 02602--------

SECTION 02603 - EMULSIFIED ASPHALT TACK COAT

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The General Provision of the contract, including the General Provisions for Construction Projects (2016), Special Provisions, and General Requirements of the Specifications, apply to the work specified in this section. This Section shall be in accordance with FAA Specification Item P-603: Emulsified Asphalt Tack Coat, as included as an attachment to this Section.

1.2 DESCRIPTION OF WORK

A. This Section shall consist of preparing and treating an asphalt or concrete surface with asphalt material in accordance with these specifications and in reasonably close conformity to the lines shown on the plans, or as directed by the Engineer.

1.3 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02401 – Asphalt Mix Pavement; FAA Specification Item P-401.

1.4 REFERENCES

A. Federal Aviation Administration (FAA)

1. FAA Specification Item P-603: Emulsified Asphalt Tack Coat.

1.5 SUBMITTALS

A. Manufacturer’s Certificate of Analysis for the emulsified asphalt material shall be submitted in accordance with FAA Specification Item P-603, paragraph 603-2.1.

B. Asphalt Distributor Calibration Certificate shall be submitted in accordance with FAA Specification Item P-603, paragraph 603-3.2.

C. Asphalt material and application rate shall be submitted in accordance with FAA Specification Item P-603, paragraph 603-3.3.

D. Waybills and delivery tickets shall be submitted in accordance with FAA Specification Item P-603, paragraph 603-3.4.

PART 2 - PRODUCTS

2.1 Emulsified asphalt material: in accordance with FAA Specification Item P-603, paragraph 603-2.1.

PART 3 - EXECUTION

3.1 Construction methods shall be in accordance with FAA Specification Item P-603.

PART 4 - MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Method of measurement and payment shall be in accordance with FAA Specification Item P-603, paragraph 603-4.1.

4.2 BASIS OF PAYMENT

A. Basis for payment shall be in accordance with FAA Specification Item P-603, paragraph 603-5.1.

PART 5 - ATTACHMENTS

5.1 FAA Specification Item P-603 Emulsified Asphalt Tack Coat.

Item P-603 Emulsified Asphalt Tack Coat

DESCRIPTION

603-1.1 This item shall consist of preparing and treating an asphalt or concrete surface with asphalt material in accordance with these specifications and in reasonably close conformity to the lines shown on the plans, or as directed by the Engineer.

MATERIALS

603-2.1 Asphalt materials. The asphalt material shall be an emulsified asphalt as specified in ASTM D3628 as an asphalt application for tack coat appropriate to local conditions. The emulsified asphalt shall not be diluted. The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the asphalt material to the engineer before the asphalt material is applied for review and acceptance. The furnishing of COA for the asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

CONSTRUCTION METHODS

603-3.1 Weather limitations. The tack coat shall be applied only when the existing surface is dry and the atmospheric temperature is 50°F or above; the temperature has not been below 35°F for the 12 hours prior to application; and when the weather is not foggy or rainy. The temperature requirements may be waived when directed by the engineer.

603-3.2 Equipment. The Contractor shall provide equipment for heating and applying the emulsified asphalt material. The emulsion shall be applied with a manufacturer-approved computer rate-controlled asphalt distributor. The equipment shall be in good working order and contain no contaminants or diluents in the tank. Spray bar tips must be clean, free of burrs, and of a size to maintain an even distribution of the emulsion. Any type of tip or pressure source is suitable that will maintain predetermined flow rates and constant pressure during the application process with application speeds under eight (8) miles per hour or seven (700) feet per minute.

The equipment will be tested under pressure for leaks and to ensure proper set-up before use to verify truck set-up (via a test-shot area), including but not limited to, nozzle tip size appropriate for application, spray-bar height and pressure and pump speed, evidence of triple-overlap spray pattern, lack of leaks, and any other factors relevant to ensure the truck is in good working order before use.

The distributor truck shall be equipped with a minimum 12-foot spreader spray bar with individual nozzle control with computer-controlled application rates. The distributor truck shall have an easily accessible thermometer that constantly monitors the temperature of the emulsion, and have an operable mechanical tank gauge that can be used to cross-check the computer accuracy. If the distributor is not equipped with an operable quick shutoff valve, the prime operations shall be started and stopped on building paper.

The distributor truck shall be equipped to effectively heat and mix the material to the required temperature prior to application as required. Heating and mixing shall be done in accordance with the manufacturer's recommendations. Do not overheat or over mix the material.

The distributor shall be equipped with a hand sprayer.

Asphalt distributors must be calibrated annually in accordance with ASTM D2995. The Contractor must furnish a current calibration certification for the asphalt distributor truck from any State or other agency as approved by the engineer.

A power broom and/or power blower suitable for cleaning the surfaces to which the asphalt tack coat is to be applied shall be provided.

603-3.3 Application of emulsified asphalt material. The emulsified asphalt shall not be diluted. Immediately before applying the emulsified asphalt tack coat, the full width of surface to be treated shall be swept with a power broom and/or power blower to remove all loose dirt and other objectionable material.

The emulsified asphalt material shall be uniformly applied with an asphalt distributor at the rates appropriate for the conditions and surface specified in the table below. The type of asphalt material and application rate shall be approved by the engineer prior to application.

Emulsified Asphalt

Surface Type	Residual Rate, gal/SY	Emulsion Application Bar Rate, gal/SY
New asphalt	0.02-0.05	0.03-0.07
Existing asphalt	0.04-0.07	0.06-0.11
Milled Surface	0.04-0.08	0.06-0.12
Concrete	0.03-0.05	0.05-0.08

After application of the tack coat, the surface shall be allowed to cure without being disturbed for the period of time necessary to permit drying and setting of the tack coat. This period shall be determined by the engineer. The Contractor shall protect the tack coat and maintain the surface until the next course has been placed. When the tack coat has been disturbed by the Contractor, tack coat shall be reapplied at the Contractor's expense.

603-3.4 Freight and waybills The Contractor shall submit waybills and delivery tickets, during progress of the work. Before the final statement is allowed, file with the engineer certified waybills and certified delivery tickets for all emulsified asphalt materials used in the construction of the pavement covered by the contract. Do not remove emulsified asphalt material from storage until the initial outage and temperature measurements have been taken. The delivery or storage units will not be released until the final outage has been taken.

METHOD OF MEASUREMENT

603-4.1 The emulsified asphalt material for tack coat will not be measured and paid for separately but shall be considered incidental to and included in the bid prices for 02401 – Asphalt Mix Pavement.

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM D1250	Standard Guide for Use of the Petroleum Measurement Tables
ASTM D2995	Standard Practice for Estimating Application Rate and Residual Application Rate of Bituminous Distributors
ASTM D3628	Standard Practice for Selection and Use of Emulsified Asphalts

END OF ITEM P-603

--------END OF SECTION 02603--------

SECTION 02608 – RAPID CURE SEAL COAT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The General Provision of the contract, including the General Provisions for Construction Projects (2016), Special Provisions, and General Requirements of the Specifications, apply to the work specified in this section. This Section shall be in accordance with FAA Specification Item P-608-R: Rapid Cure Seal Coat, as included as an attachment to this Section.

1.2 DESCRIPTION OF WORK

A. This item shall consist of the application of an asphalt surface treatment composed of natural and refined asphalt materials, additives, and light oils, for taxiways and runways with the application of a suitable aggregate to maintain adequate surface friction; and airfield secondary and tertiary pavements including aprons, shoulders, overruns, roads, parking areas, and other general applications with or without aggregate applied as designated on the plans, or as directed by the Engineer.

1.3 RELATED WORK SPECIFIED ELSEWHERE (Not Used)

1.4 REFERENCES

A. Federal Aviation Administration (FAA)

1. FAA Specification Item P-608-R: Rapid Cure Seal Coat.

1.5 SUBMITTALS

A. Specialty sand manufacturer's technical data and a manufacturer's Certificate of Analysis (COA) shall be submitted in accordance with FAA Specification Item P-608-R, paragraph 608-R-2.1.

B. Certificate of Analysis (COA) for the polymer shall be submitted in accordance with FAA Specification Item P-608-R, paragraph 608-R-2.2.

C. Specialty aggregate manufacturer's technical data and the specialty aggregate manufacturer's certification shall be submitted in accordance with FAA Specification Item P-608-R, paragraph 608-R-2.1.

PART 2 - PRODUCTS

2.1 Aggregates: in accordance with FAA Specification Item P-608-R, paragraph 608-R-2.1.

2.2 Asphalt Material: in accordance with FAA Specification Item P-608-R, paragraph 608-R-2.2.

PART 3 - EXECUTION

3.1 Construction methods shall be in accordance with FAA Specification Item P-608-R.

3.2 The Contractor Quality Control shall be in accordance with FAA Specification Item P-608-R.

3.3 Acceptance shall be in accordance with FAA Specification Item P-608-R.

PART 4 - MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Method of measurement and payment shall be in accordance with FAA Specification Item P-608-R, paragraph 608-R-7.1.

4.2 BASIS OF PAYMENT

A. Basis for payment shall be in accordance with FAA Specification Item P-608-R, paragraph 608-R-8.1.

PART 5 - ATTACHMENTS

5.1 FAA Specification Item P-608-R Emulsified Asphalt Seal Coat.

Item P-608-R Rapid Cure Seal Coat

DESCRIPTION

608-R-1.1 This item shall consist of the application of an asphalt surface treatment composed of natural and refined asphalt materials, additives, and light oils, for taxiways and runways with the application of a suitable aggregate to maintain adequate surface friction; and airfield secondary and tertiary pavements including aprons, shoulders, overruns, roads, parking areas, and other general applications with or without aggregate applied as designated on the plans, or as directed by the Engineer.

The terms seal coat, asphalt sealer, and asphalt material are interchangeable throughout this specification. The term asphalt means natural and refined asphalt materials in this specification.

MATERIALS

608-R-2.1 Aggregate. The fine-aggregate material shall be a dry, clean, sound, durable, angular shaped, with highly textured surfaces, manufactured specialty abrasive aggregate. It shall have 100% fractured faces, SiO2 content of 55% minimum, CaO of **3**% max, with a sand equivalent greater than 85 and a Mohs hardness of 7 or greater. Additional characteristics as outlined in the following table(s). The Contractor shall submit specialty aggregate manufacturer's technical data and the specialty aggregate manufacturer's certification indicating that the specialty aggregate meets the requirements of the specification to the Engineer prior to start of construction. The aggregate must be approved for use by the Engineer and shall meet the following gradation limits when tested in accordance with ASTM C136:

Aggregate Material Gradation Requirements

Sieve Designation	Percentage by Weight Passing Sieves
No. 8	100
No. 14	98-100
No. 16	85-100
No. 30	15-45
No. 50	0-8
No. 70	0-2

Aggregate Characteristics

Test	Standard	Range
Micro-Deval	ASTM D7428	15% max
Magnesium Sulfate Soundness	ASTM C88	2% max
Aggregate Angularity	ASTM C1252 – Test Method A	45% min
Moisture Content (%)	ASTM C566	2% max
Bulk Dry Specific Gravity	ASTM C128	2.6 – 3.0
Absorption (%)	ASTM D2216	3% max
Mohs Hardness	Mohs Scale	7 min

The Contractor shall provide a certification of analysis (COA) showing analysis and properties of the material delivered for use on the project. The Contractor's certification may be subject to verification by testing the material delivered for use on the project.

608-R-2.2 Asphalt Material. The asphalt material base residue shall contain not less than 40% gilsonite, or uintaite, and shall not contain any tall oil pitch or coal tar material. The material shall be compatible with asphalt pavement, and have a 5-year minimum proven aviation performance record at airports with similar climatic conditions. The solvent-based rapid cure material shall meet the following properties:

Properties for Asphalt Sealing Material

Properties	Specification	Limits
Kinematic Viscosity at 140°F (60°C)	ASTM D4402	10-30 cSt
Percent Residue by Distillation	ASTM D402	30-45%

Tests on Residue from Distillation

Properties	Specification	Limits
Penetration at 77°F (25°C)	ASTM D5	2-12 dmm
Softening Point	ASTM D36	180-200
Solubility in 1,1,1 Trichloroethylene	ASTM D2042	99% min.
HCI Precipitation Value		18-25

The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the asphalt sealer delivered to the project. If the asphalt sealer is diluted at other than the manufacturer's facility, the Contractor shall provide a supplemental COA from an independent laboratory verifying the asphalt sealer properties. The COA shall be provided to and approved by the Engineer before the asphalt material is applied. The furnishing of the vendor's certified test report for the asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

The asphalt sealing material must be applied in an undiluted form. The material may be stored at ambient temperature for long periods of time if necessary. Storage will follow industry standard recommendations due to the flammability of the material; avoid sparks and open flames to come into contact with the material or any gasses that might be escaping the storage vessel.

Contractor shall provide a list of airport pavement projects, exposed to similar climate conditions, where this product has been successfully applied within at least 5 years of the project.

COMPOSITION AND APPLICATION RATE

608-R-3.1 Application Rate. The approximate amounts of materials per square yard (square meter) for the asphalt surface treatment shall be as provided in the table for the treatment area(s) at the specified rate(s) as noted on the plans. The actual application rates will vary within the range specified to suit field conditions and will be recommended by the manufacturer's representative for control strip evaluations, and approved by the Engineer from the test area/sections evaluation.

Application Rate

Dilution Rate	Quantity of Sealer gal/yd^2 (l/m^2)	Quantity of Aggregate lb/yd^2 (kg/m^2)
N/A	0.08-0.15 (0.36-0.68)	0.40-0.50 (0.11-0.22)

608-R-3.2 Control areas and control strips. A qualified manufacturer's representative shall be present in the field to assist the Contractor in applying control areas and/or control strips to determine the appropriate application rate of both sealer and aggregate to be evaluated and approved by the RPR.

A test area and/or section shall be applied for each differing asphalt pavement surface identified in the project. The control area(s) and/or control strip(s) shall be used to determine the material application rate(s) of both sealer and aggregate prior to full production. The same equipment and method of operation shall be utilized on the control area(s) and/or control strip(s) as will be utilized on the remainder of the work. Variations of the Control areas and control strips must be approved by the Engineer

a. For taxiway, taxilane and apron surfaces. Prior to full application, the Contractor shall place test areas at varying application rates as recommended by the Contractor's manufacturer's representative to determine appropriate application rate(s). The test areas will be located on representative section(s) of the pavement to receive the asphalt surface treatment designated by the Engineer.

b. For runway and high-speed exit taxiway surfaces. Prior to full application, the Contractor shall place a series of control strips a minimum of 300 feet (90 m) long by 12 feet (3.6 m) wide, or width of anticipated application, whichever is greater, at varying application rates as recommended by the manufacturer's representative and acceptable to the Engineer to determine appropriate application rate(s). The control strips should be separated by a minimum of 200 feet between control strips. The area to be tested will be located on a representative section of the pavement to receive the asphalt surface treatment designated by the Engineer. The control strips should be placed under similar field conditions as anticipated for the actual application. Before beginning the control strip(s), the skid resistance of the existing pavement shall be determined for each control strip with a continuous friction measuring equipment (CFME). The skid resistance of existing pavement can be immediately adjacent to the control strip or at the same location as the control strip if testing prior to application.

The Contractor may begin testing the skid resistance of runway and high-speed exit taxiway control strips after application of the asphalt surface treatment has fully cured, generally 2 to 4 hours after application of the control strips depending on site conditions. Aircraft shall not be permitted on the runway or high-speed exit taxiway control strips until such time as the Contractor validates that its surface friction meets the maintenance planning friction levels in AC 150/5320-12, Table 3-2 when tested at speeds of 40 and 60 mph (65 and 95 km/h) wet with approved CFME.

c. Control strip. If the control strip should prove to be unsatisfactory, necessary adjustments to the application rate, placement operations, and equipment shall be made. Additional control strips shall be placed and additional skid resistance tests performed and evaluated. Full production shall not begin without the Engineer's approval of an appropriate application rate(s). Acceptable control strips shall be paid for in accordance with paragraph 608-R-8.1.

CONSTRUCTION METHODS

608-R-4.1 Worker safety. The Contractor shall obtain a Safety Data Sheet (SDS) for both the asphalt sealer product and aggregate and require workmen to follow the manufacturer's recommended safety precautions. All additional industry standard safety precautions regarding the storage and applications of solvent based asphalts should be understood and followed by the Contractor.

608-R-4.2 Weather limitations. The asphalt sealer shall be applied only when the existing pavement surface is dry and when the weather is not foggy, rainy, or when the wind velocity will prevent the uniform application of the material. No material shall be applied when dust or aggregate is blowing or when rain is anticipated within four (4) hours of application completion. The atmospheric temperature and the pavement surface temperature shall both be at, or above 55°F (14°C) and rising. The sealer will shall not be applied when pavement temperatures are expected to exceed 160F within the subsequent 72 hours if traffic will be opened on pavement within those 72 hours. During application, account for wind drift. Cover existing buildings, structures, runway edge lights, taxiway edge lights, informational signs, retro-reflective marking and in-pavement duct markers as necessary to protect against overspray before applying the sealer. Should sealer get on any light or marker fixture, promptly clean the fixture. If cleaning is not satisfactory to the Engineer, the Contractor shall replace any light, sign or marker with equivalent equipment at no cost to the Owner.

608-R-4.3 Equipment and tools. The Contractor shall furnish all equipment, tools, and machinery necessary for the performance of the work.

a. Pressure distributor. The sealer shall be applied with a manufacturer-approved computer rate-controlled asphalt distributor. The equipment shall be in good working order and contain no contaminants or diluents in the tank. Spray bar tips must be clean, free of burrs, and of a size to maintain an even distribution of the sealer. Any type of tip or pressure source is suitable that will maintain predetermined flow rates and constant pressure during the application process with application speeds under eight (8) miles per hour (13 km per hour) or seven (700) feet per minute (213 m per minute). The Contractor will provide verification of truck set-up (via a test-shot area), including but not limited to, nozzle tip size appropriate for application per nozzle manufacturer, spray-bar height and pressure and pump speed appropriate for the viscosity and temperature of sealer material, evidence of triple-overlap spray pattern, lack of leaks, and any other factors relevant to ensure the truck is in good working order before use. The distributor truck shall be equipped with a 12-foot (3.7-m), minimum, spray bar with individual nozzle control. The distributor truck shall be capable of specific application rates in the range of 0.05 to 0.25 gallons per square yard (0.15 to 0.80 liters per square meter). These rates shall be computer-controlled rather than mechanical. The distributor truck shall have an easily accessible thermometer that constantly monitors the temperature of the sealer, and have an operable mechanical tank gauge that can be used to cross-check the computer accuracy.

The distributor truck shall effectively mix the material prior to application.

The distributor shall be equipped with a hand sprayer to spray the sealer in areas not accessible to the distributor truck.

b. Aggregate spreader. The asphalt distributor truck will be equipped with an aggregate spreader mounted to the distributor truck that can apply aggregate to the sealer in a single pass operation without driving through wet sealer. The aggregate spreader shall be equipped with a variable control system capable of uniformly distributing the aggregate at the specified rate at varying application widths and speeds. The aggregate spreader must be adjusted to produce an even and accurate application of specified aggregate. Prior to any seal coat application, the aggregate spreader will be calibrated onsite to ensure acceptable uniformity of spread. The Engineer will observe the calibration and verify the results. The aggregate spreader will be re-calibrated each time the aggregate rate is changed either during the application of test strips or production. The Contractor may consult the seal coat manufacturer

representative for procedure and guidance. The aggregate spreader shall have a minimum hopper capacity of 3,000 pounds (1361 kg) of aggregate. Push-type hand spreaders will be allowed for use around lights, signs and other obstructions, if necessary.

c. Power broom/blower. A power broom and/or blower shall be provided for removing loose material from the surface to be treated.

d. Equipment calibration. Asphalt distributors must be calibrated within the same construction season in accordance with ASTM D2995. The Contractor must furnish a current calibration certification for the asphalt distributor truck from any State or other agency as approved by the Engineer.

608-R-4.4 Preparation of asphalt pavement surfaces. Clean pavement surface immediately prior to placing the seal coat so that it is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film. Remove oil or grease from the asphalt pavement by scrubbing with a detergent, washing thoroughly with clean water, and treating these areas with the oil spot primer. Any additional surface preparation, such as crack repair, shall be in accordance with Item P-101, paragraph 101-3.6.

608-R-4.5 Application of asphalt sealer. The asphalt sealer shall be applied using a pressure distributor upon the properly prepared, clean and dry surface at the application rate recommended by the manufacturer's representative and approved by the Engineer from the test area/sections evaluation for each designated treatment area. Recommended material temperature for application is 70°F to 90°F, but depending on the application equipment used, good material dispersion and pavement coverage may be achieved at lower material temperatures. The material should not be heated above 100°F.

Pavement surfaces which have excessive runoff of seal coat due to excessive amount of material being applied or excessive surface grade shall be treated in two or more applications, if feasible, to the specified application rate at no additional cost to the Owner. Each additional application shall be performed after the prior application of material has penetrated into the pavement.

If low spots and depressions greater than 1/2 inch (12 mm) in depth in the pavement surface cause ponding or puddling of the applied materials, the pavement surface shall be lightly broomed with a broom or brush type squeegee. Brooming shall continue until the pavement surface is free of any pools of excess material. Ponding and/or puddling shall not cause excessive pavement tackiness and/or additional distress.

During all applications, the surfaces of adjacent structures shall be protected to prevent their being spattered or marred. Asphalt materials shall not be discharged into borrow pits or gutters or on the airport area.

Caution. *Heating asphalt binders of any kind always constitutes some degree of hazard. The most hazardous of these are cutback asphalts because of the highly volatile solvents used. Care must be taken not to allow any spark or open flame to come in contact with the cutback asphalt or the gases from cutback asphalt due to the low flash point. It is the Contractor's responsibility to understand and adhere to these standards in regards to staying within the recommended application temperatures of this material and at all times during production.*

608-R-4.6 Application of aggregate material. Immediately following the application of the asphalt sealer, aggregate at the rate recommended by the manufacturer's representative and approved by the Engineer from the test area/sections evaluation for each designated application area, shall be spread uniformly over the asphalt sealer in a single-pass operation simultaneous with the sealer application. The sealer material and aggregate shall be applied simultaneously in a single pass operation, so as to not drive through the applied fresh sealer. The aggregate shall be spread to the same width of application as the asphalt material and shall not be applied in such thickness as to cause blanketing.

Sprinkling of additional aggregate material, and spraying additional asphalt material over areas that show up having insufficient cover or bitumen, shall be done by hand whenever necessary. In areas where hand work is necessitated, the aggregate shall be applied before the sealant begins to break.

Minimize aggregate from being broadcast and accumulating on the untreated pavement adjacent to an application pass. Prior to the next application pass, the Contractor shall clean areas of excess or loose aggregate and remove from project site.

QUALITY CONTROL (QC)

608-R-5.1 Manufacturer's representation. The manufacturer's representative knowledgeable of the material, procedures, and equipment described in the specification is responsible to assist the Contractor and Engineer in determining the appropriate application rates of the emulsion and aggregate, as well as recommendations for proper preparation and start-up of seal coat application. Documentation of the manufacturer representative's experience and knowledge for applying the seal coat product shall be furnished to the Engineer a minimum of 10 work days prior to placement of the control strips. The cost of the manufacturer's representative shall be included in the Contractor's bid price.

MATERIAL ACCEPTANCE

608-R-6.1 Application rate. The rate of application of the asphalt emulsion shall be verified at least twice per day.

METHOD OF MEASUREMENT

608-R-7.1 Asphalt surface treatment. The quantity of asphalt surface treatment shall be measured by the square yards of material applied in accordance with the plans and specifications and accepted by the Engineer.

The Contractor must furnish the Engineer with the certified weigh bills when materials are received for the asphalt material used under this contract. The Contractor must not remove material from the tank car or storage tank until initial amounts and temperature measurements have been verified.

BASIS OF PAYMENT

608-R-8.1 Payment shall be made at the contract unit price per square yard for the asphalt surface treatment applied and accepted by the Engineer. This price shall be full compensation for all surface preparation, furnishing all materials, delivery and application of these materials, for all labor, equipment, tools, and incidentals necessary to complete the item, including furnishing a qualified manufacturer's representative to assist with control strips.

Payment will be made under:

ITEM NO.	ITEM	UNIT
02608.1	Rapid Cure Seal Coat	Square Yard

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate

ASTM C117	Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C128	Standard Test Method for Relative Density (Specific Gravity) and Absorption of Fine Aggregate
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C566	Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying
ASTM C1252	Standard Test Methods for Uncompacted Void Content of Fine Aggregate
ASTM D5	Standard Test Method for Penetration of Asphalt Materials
ASTM D36	Standard Test Method for Softening Point of Bitumen (Ring-and-Ball Apparatus)
ASTM D402	Standard Test Method for Distillation of Cutback Asphalt
ASTM D2042	Standard Test Method for Solubility of Asphalt Materials in Trichloroethylene
ASTM D2216	Standard Test Methods for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D2995	Standard Practice for Estimating Application Rate of Bituminous Distributors
ASTM D4402	Standard Test Method for Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer
ASTM D5340	Standard Test Method for Airport Pavement Condition Index Surveys
ASTM D6433	Standard Practice for Roads and Parking Lots Pavement Condition Index Surveys
ASTM D6997	Standard Test Method for Distillation of Emulsified Asphalt
ASTM D7428	Standard Test Method for Resistance of Fine Aggregate to Degradation by Abrasion in the Micro-Deval Apparatus Advisory Circulars (AC)
AC 150/5320-12	Measurement, Construction, and Maintenance of Skid-Resistant Airport Pavement Surfaces
AC 150/5320-17	Airfield Pavement Surface Evaluation and Rating (PASER) Manuals
AC 150/5380-6	Guidelines and Procedures for Maintenance of Airport Pavements
AC 150/5380-7	Airport Pavement Management Program (PMP)

END OF ITEM P-608-R

SECTION 02620 - RUNWAY AND TAXIWAY MARKINGS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The General Provisions of the contract, including the General Provisions for Construction Projects (2016), Special Provisions, and General Requirements of the Specifications, apply to the work specified in this section. This Section shall be in accordance with FAA Specification Item P-620: Runway and Taxiway Markings, as included as an attachment to this Section.

1.2 DESCRIPTION OF WORK

A. This Section shall consist of the preparation and painting of numbers, markings, and stripes on the surface of runways, taxiways, and aprons, in accordance with these specifications and at the locations shown on the plans, or as directed by the Engineer. The terms “paint” and “marking material” as well as “painting” and “application of markings” are interchangeable throughout this specification.

1.3 RELATED WORK SPECIFIED ELSEWHERE

1.4 REFERENCES

A. Federal Aviation Administration (FAA)

1. FAA Specification Item P-620: Runway and Taxiway Markings.

1.5 SUBMITTALS

A. Manufacturer’s certified test reports for all materials shipped to the project shall be submitted in accordance with FAA Specification Item P-620, paragraph 620-2.1.

B. Contractor certification of surface preparation shall be submitted in accordance with FAA Specification Item P-620, paragraph 620-3.3.

C. Copy of paint manufacturer’s application and surface preparation requirements shall be submitted in accordance with FAA Specification Item P-620, paragraph 620-3.3.

PART 2 - PRODUCTS

2.1 Paint: in accordance with FAA Specification Item P-620, paragraph 620-2.2.a.

2.2 Reflective media: in accordance with FAA Specification Item P-620, paragraph 620-2.2.b.

PART 3 - EXECUTION

3.1 Construction methods shall be in accordance with FAA Specification Item P-620.

PART 4 - MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Method of measurement and payment shall be in accordance with FAA Specification Item P-620, paragraph 620-4.1a and paragraph 620-4.1b.

4.2 BASIS OF PAYMENT

A. Basis for payment shall be in accordance with FAA Specification Item P-620, paragraph 620-5.1, paragraph 620-5.2a, and paragraph 620-5.4b

PART 5 - ATTACHMENTS

5.1 FAA Specification Item P-620 Runway and Taxiway Marking.

Item P-620 Runway and Taxiway Marking

DESCRIPTION

620-1.1 This item shall consist of the preparation and painting of numbers, markings, and stripes on the surface of runways, taxiways, and aprons, in accordance with these specifications and at the locations shown on the plans, or as directed by the Engineer. The terms "paint" and "marking material" as well as "painting" and "application of markings" are interchangeable throughout this specification.

MATERIALS

620-2.1 Materials acceptance. The Contractor shall furnish manufacturer's certified test reports, for materials shipped to the project. The certified test reports shall include a statement that the materials meet the specification requirements. This certification along with a copy of the paint manufacturer's surface preparation; marking materials, including adhesion, flow promoting and/or floatation additive; and application requirements must be submitted and approved by the Engineer prior to the initial application of markings. The reports can be used for material acceptance or the Engineer may perform verification testing. The reports shall not be interpreted as a basis for payment. The Contractor shall notify the Engineer upon arrival of a shipment of materials to the site. All material shall arrive in sealed containers that are easily quantifiable for inspection by the Engineer.

620-2.2 Marking materials.

Table 1. Marking Materials

Paint[1]				Glass Beads[2]	
Type	**Color**	**Fed Std. 595 Number**	**Application Rate Maximum**	**Type**	**Application Rate Minimum**
Waterborne Type II	White	37925	115 ft^2/gal	Type I, Gradation A	7 lb/gal
Waterborne Type II	Red	31136	115 ft^2/gal	Type I, Gradation A	5 lb/gal
Waterborne Type II	Yellow	33538 or 33655	115 ft^2/gal	Type I, Gradation A	7 lb/gal
Waterborne Type II	Black	37038	115 ft^2/gal	None	None
Temporary Marking Waterborne Type I	White	37925	230 ft^2/gal	None	None
Temporary Marking Waterborne Type I	Yellow	33538 or 33655	230 ft^2/gal	None	None

[1] See paragraph 620-2.2a

[2] See paragraph 620-2.2b

a. Paint. Paint shall be waterborne in accordance with the requirements of this paragraph. Paint colors shall comply with Federal Standard No. 595. Waterborne black paint shall be used to outline a border at least 6 inches (150 mm) wide around markings on all light-colored pavements, or as directed by the Engineer.

Waterborne. Paint shall meet the requirements of Federal Specification TT-P-1952F, Type II. The non-volatile portion of the vehicle for all paint types shall be composed of a 100% acrylic polymer as determined by infrared spectral analysis.

b. Reflective media. Glass beads for white and yellow paint shall meet the requirements for Federal Specification TT-B-1325D Type I, Gradation A.

Glass beads for red paint shall meet the requirements for Type I, Gradation A.

Glass beads shall be treated with all compatible coupling agents recommended by the manufacturers of the paint and reflective media to ensure adhesion and embedment.

Glass beads shall not be used in black paint.

CONSTRUCTION METHODS

620-3.1 Weather limitations. Painting shall only be performed when the surface is dry, and the ambient temperature and the pavement surface temperature meet the manufacturer's recommendations in accordance with paragraph 620-2.1. Painting operations shall be discontinued when the ambient or surface temperatures does not meet the manufacturer's recommendations.

Markings shall not be applied when the wind speed exceeds 10 mph unless windscreens are used to shroud the material guns. Markings shall not be applied when weather conditions are forecasts to not be within the manufacturers' recommendations for application and dry time.

620-3.2 Equipment. Equipment shall include the apparatus necessary to properly clean the existing surface, a mechanical marking machine, a bead dispensing machine, and such auxiliary hand-painting equipment as may be necessary to satisfactorily complete the job.

The mechanical marker shall be an atomizing spray-type or airless type marking machine with automatic glass bead dispensers suitable for application of traffic paint. It shall produce an even and uniform film thickness and appearance of both paint and glass beads at the required coverage and shall apply markings of uniform cross-sections and clear-cut edges without running or spattering and without over spray. The marking equipment for both paint and beads shall be calibrated daily.

620-3.3 Preparation of surfaces. Immediately before application of the paint, the surface shall be dry and free from dirt, grease, oil, laitance, or other contaminates that would reduce the bond between the paint and the pavement. Use of any chemicals or impact abrasives during surface preparation shall be approved in advance by the Engineer. After the cleaning operations, sweeping, blowing, or rinsing with pressurized water shall be performed to ensure the surface is clean and free of grit or other debris left from the cleaning process.

a. Preparation of new pavement surfaces. The area to be painted shall be cleaned by broom, blower, water blasting, or by other methods approved by the Engineer to remove all contaminants, including PCC curing compounds, minimizing damage to the pavement surface.

b. Preparation of pavement to remove existing markings. Existing pavement markings shall be removed by rotary grinding, water blasting, or by other methods approved by the Engineer minimizing damage to the pavement surface. The removal area may need to be larger than the area of the markings to eliminate ghost markings. After removal of markings on asphalt pavements, apply a fog seal or seal coat to 'block out' the removal area to eliminate 'ghost' markings.

c. Preparation of pavement markings prior to remarking. Prior to remarking existing markings, loose existing markings must be removed minimizing damage to the pavement surface, with a method approved by the Engineer. After removal, the surface shall be cleaned of all residue or debris.

Prior to the application of markings, the Contractor shall certify in writing that the surface is dry and free from dirt, grease, oil, laitance, or other foreign material that would prevent the bond of the paint to the pavement or existing markings. This certification along with a copy of the paint manufactures application and surface preparation requirements must be submitted to the Engineer prior to the initial application of markings.

620-3.4 Layout of markings. The proposed markings shall be laid out in advance of the paint application. The locations of markings to receive glass beads shall be shown on the plans.

620-3.5 Application. A period of **30** days shall elapse between placement of surface course or seal coat and application of the permanent paint markings. Paint shall be applied at the locations and to the dimensions and spacing shown on the plans. Paint shall not be applied until the layout and condition of the surface has been approved by the Engineer.

The edges of the markings shall not vary from a straight line more than 1/2 inch in 50 feet, and marking dimensions and spacing shall be within the following tolerances:

Marking Dimensions and Spacing Tolerance

Dimension and Spacing	Tolerance
36 inch or less	±1/2 inch
greater than 36 inch to 6 feet	±1 inch
greater than 6 feet to 60 feet	±2 inch
greater than 60 feet	±3 inch

The paint shall be mixed in accordance with the manufacturer's instructions and applied to the pavement with a marking machine at the rate shown in Table 1. The addition of thinner will not be permitted.

Glass beads shall be distributed upon the marked areas per the table below and shall receive glass beads immediately after application of the paint. A dispenser shall be furnished that is properly designed for attachment to the marking machine and suitable for dispensing glass beads. Glass beads shall be applied at the rate shown in Table 1. Glass beads shall not be applied to black paint or green paint. Glass beads shall adhere to the cured paint or all marking operations shall cease until corrections are made. Different bead types shall not be mixed. Regular monitoring of glass bead embedment and distribution should be performed.

Markings that require Glass Beads and 6" Black Enhancements (Borders)

Description	Color	Glass Beads	6" Black Enhancement (Border)
Runway Centerline Markings	White	Yes	Enhanced
Runway Aiming Points	White	Yes	Enhanced
Runway Touchdown Zone Markings	White	Yes	Enhanced
Runway Threshold Markings	White	Yes	Enhanced
Runway Threshold Bar	White	Yes	Enhanced
Runway Identifier Markings	White	Yes	Enhanced
Runway Displaced Threshold Marking	White	Yes	Enhanced
Runway Edge Line	White	Yes	No
Runway Shoulder Marking	Yellow	No	No
Taxiway Centerline Marking	Yellow	Yes	No
Taxiway Edge Marking	Yellow	No	No
Non-movement Area Boundary Marking	Yellow	Yes	Yes
Holding Position Markins	Yellow	Yes	Yes
Surface Painted Hold Position Signs	Red	Yes	Yes

620-3.6 Application--preformed thermoplastic airport pavement markings.

Preformed thermoplastic pavement markings not used.

620-3.7 Control strip. Prior to the full application of airfield markings, the Contractor shall prepare a control strip in the presence of the Engineer. The Contractor shall demonstrate the surface preparation method and all striping equipment to be used on the project. The marking equipment must achieve the prescribed application rate of paint and population of glass beads (per Table 1) that are properly embedded and evenly distributed across the full width of the marking. Prior to acceptance of the control strip, markings must be evaluated during darkness to ensure a uniform appearance.

620-3.8 Retro-reflectance. Reflectance shall be measured with a portable retro-reflectometer meeting ASTM E1710 (or equivalent). A total of 6 reading shall be taken over a 6 square foot area with 3 readings taken from each direction. The average shall be equal to or above the minimum levels of all readings which are within 30% of each other.

Minimum Retro-Reflectance Values

Material	Retro-reflectance mcd/m^2/lux		
	White	**Yellow**	**Red**
Initial Type I	300	175	35
Initial Type III	600	300	35
Initial Thermoplastic	225	100	35
All materials, remark when less than[1]	100	75	10

1 'Prior to remarking determine if removal of contaminants on markings will restore retro-reflectance

620-3.9 Protection and cleanup. After application of the markings, all markings shall be protected from damage until dry. All surfaces shall be protected from excess moisture and/or rain and from disfiguration by spatter, splashes, spillage, or drippings. The Contractor shall remove from the work area all debris, waste, loose reflective media, and by-products generated by the surface preparation and application operations to the satisfaction of the Engineer. The Contractor shall dispose of these wastes in strict compliance with all applicable state, local, and federal environmental statutes and regulations.

METHOD OF MEASUREMENT

620-4.1a The quantity of markings shall be paid for shall be measured by the number of square feet of painting.

620-4.1b The quantity of temporary markings shall be paid for shall be measured by the number of square feet of painting performed in accordance with the specifications and accepted by the Engineer. Temporary marking includes surface preparation, application and complete removal of the temporary marking.

BASIS OF PAYMENT

620-5.1 This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item complete in place and accepted by the Engineer in accordance with these specifications.

620-5.2a Payment for markings shall be made at the contract price for the number of square feet of painting**.**

620-5.4b Payment for temporary markings shall be made at the contract price for the number of square feet of painting. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

ITEM NO.	ITEM	UNIT
Item 02620.1	Runway and Taxiway Marking	Square Foot
Item 02620.2	Temporary Runway and Taxiway Marking	Square Foot

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM D476	Standard Classification for Dry Pigmentary Titanium Dioxide Products
ASTM D968	Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM D1652	Standard Test Method for Epoxy Content of Epoxy Resins
ASTM D2074	Standard Test Method for Total, Primary, Secondary, and Tertiary Amine Values of Fatty Amines by Alternative Indicator Method
ASTM D2240	Standard Test Method for Rubber Property - Durometer Hardness
ASTM D7585	Standard Practice for Evaluating Retroreflective Pavement Markings Using Portable Hand-Operated Instruments
ASTM E303	Standard Test Method for Measuring Surface Frictional Properties Using the British Pendulum Tester
ASTM E1710	Standard Test Method for Measurement of Retroreflective Pavement Marking Materials with CEN-Prescribed Geometry Using a Portable Retroreflectometer
ASTM E2302	Standard Test Method for Measurement of the Luminance Coefficient Under Diffuse Illumination of Pavement Marking Materials Using a Portable Reflectometer

ASTM G154 Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

Code of Federal Regulations (CFR)

40 CFR Part 60, Appendix A-7, Method 24
Determination of volatile matter content, water content, density, volume solids, and weight solids of surface coatings

29 CFR Part 1910.1200 Hazard Communication

Federal Specifications (FED SPEC)

FED SPEC TT-B-1325D Beads (Glass Spheres) Retro-Reflective

FED SPEC TT-P-1952F Paint, Traffic and Airfield Marking, Waterborne

FED STD 595 Colors used in Government Procurement

Commercial Item Description

A-A-2886B Paint, Traffic, Solvent Based

Advisory Circulars (AC)

AC 150/5340-1 Standards for Airport Markings

AC 150/5320-12 Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces

END OF ITEM P-620

--------END OF SECTION 02620--------

SECTION 02621 - SAW-CUT GROOVES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The General Provision of the contract, including the General Provisions for Construction Projects (2016), Special Provisions, and General Requirements of the Specifications, apply to the work specified in this section. This Section shall be in accordance with FAA Specification Item P-621: Saw-cut Grooves, as included as an attachment to this Section.

1.2 DESCRIPTION OF WORK

A. This Section consists of constructing saw-cut grooves to minimize hydroplaning during wet weather, providing a skid resistant surface in accordance with these specifications and at the locations shown on the plans, or as directed by the Engineer.

1.3 RELATED WORK SPECIFIED ELSEWHERE

1.4 REFERENCES

A. Federal Aviation Administration (FAA)

1. FAA Specification Item P-621: Saw-Cut Grooves.

1.5 SUBMITTALS

A. Grooving sequence and method of placing guidelines to control grooving operation shall be submitted in accordance with FAA Specification Item P-621, paragraph 621-2.1.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 Construction methods shall be in accordance with FAA Specification Item P-621.

3.2 Acceptance shall be in accordance with FAA Specification Item P-621.

PART 4 - MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Method of measurement and payment shall be in accordance with FAA Specification Item P-621, paragraph 621-4.1.

4.2 BASIS OF PAYMENT

A. Basis for payment shall be in accordance with FAA Specification Item P-621, paragraph 621-5.1.

PART 5 - ATTACHMENTS

5.1 FAA Specification Item P-621 Saw-Cut Grooves.

Item P-621 Saw-Cut Grooves

DESCRIPTION

621-1.1 This item consists of constructing saw-cut grooves to minimize hydroplaning during wet weather, providing a skid resistant surface in accordance with these specifications and at the locations shown on the plans, or as directed by the Engineer.

CONSTRUCTION METHODS

621-2.1 Procedures. The Contractor shall submit to the Engineer the grooving sequence and method of placing guidelines to control grooving operation. Transverse grooves saw-cut in the pavement must form a 1/4 inch (+1/16 inch, -0 inch) wide by 1/4 inch (±1/16 inch) deep by 1-1/2 inch (-1/8 inch, +0 inch) center-to-center configuration. The grooves must be continuous for the entire runway length. They must be saw-cut transversely (perpendicular to centerline) in the runway and high-speed taxiway pavement to not less than 10 feet from the runway pavement edge to allow adequate space for equipment operation.

The saw-cut grooves must meet the following tolerances. The tolerances apply to each day's production and to each piece of grooving equipment used for production. The Contractor is responsible for all controls and process adjustments necessary to meet these tolerances. The Contractor shall routinely spot check for compliance each time the equipment aligns for a grooving pass.

a. Alignment tolerance. The grooves shall not vary more than ±1-1/2 inch in alignment for 75 feet along the runway length, allowing for realignment every 500 feet along the runway length.

b. Groove tolerance.

(1) Depth. The standard depth is 1/4 inch. At least 90% of the grooves must be at least 3/16 inch, at least 60% of the grooves must be at least 1/4 inch, and not more than 10% of the grooves may exceed 5/16 inch.

(2) Width. The standard width is 1/4 inch. At least 90% of the grooves must be at least 3/16 inch, at least 60% of the grooves must be at least 1/4 inch, and not more than 10% of the grooves may exceed 5/16 inch.

(3) Center-to-center spacing. The standard spacing is 1-1/2 inch. Minimum spacing 1-3/8 inch. Maximum spacing 1-1/2 inch.

Saw-cut grooves must not be closer than 3 inches or more than 9 inches from transverse joints in concrete pavements. Grooves must not be closer than 6 inches and no more than 18 inches from in-pavement light fixtures. Grooves may be continued through longitudinal construction joints. Where neoprene compression seals have been installed and the compression seals are recessed sufficiently to prevent damage from the grooving operation, grooves may be continued through the longitudinal joints. Where neoprene compression seals have been installed and the compression seals are not recessed sufficiently to prevent damage from the grooving operation, grooves must not be closer than 3 inches or more than 5 inches from the longitudinal joints. Where lighting cables are installed, grooving through longitudinal or diagonal saw kerfs shall not be allowed.

621-2.2 Environmental requirements. Discharge and disposal of waste slurry shall be the Contractor's responsibility.

621-2.3 Control strip. Groove a control strip in an area of the pavement outside of the trafficked area, as approved by the Engineer. The area shall be 150 feet long by two lanes wide. Demonstrate the setup and alignment process, the grooving operation, and the waste slurry disposal.

621-2.4 Existing pavements. Bumps, depressed areas, bad or faulted joints, and badly cracked and/or spalled areas in the pavement shall not be grooved until such areas are adequately repaired or replaced.

621-2.5 New pavements. New asphalt and Portland cement concrete pavements shall be allowed to cure for a minimum of 30 days before grooving, to allow the material to become stable enough to prevent closing of the grooves under normal use. If it can be demonstrated that grooves are stable, and can be installed with no spalling, tearing or raveling of the groove edge, grooving may occur sooner that 30 days with approval of the Engineer. All grade corrections must be completed prior to grooving. Spalling along or tearing or raveling of the groove edges shall not be allowed.

621-2.6 Grooving machine. Provide a grooving machine that is power driven, self-propelled, specifically designed and manufactured for pavement grooving, and has a self-contained and integrated continuous slurry vacuum system as the primary method for removing waste slurry. The grooving machine shall be equipped with diamond-saw cutting blades, and capable of making at least 18 inches in width of multiple parallel grooves in one pass of the machine. Thickness of the cutting blades shall be capable of making the required width and depth of grooves in one pass of the machine. The cutting head shall not contain a mixture of new and worn blades or blades of unequal wear or diameter. Match the blade type and configuration with the hardness of the existing airfield pavement. The wheels on the grooving machine shall be of a design that will not scar or spall the pavement. Provide the machine with devices to control depth of groove and alignment.

621-2.7 Water supply. Water for the grooving operation shall be provided by the Contractor.

621-2.8 Clean-up. During and after installation of saw-cut grooves, the Contractor must remove from the pavement all debris, waste, and by-products generated by the operations to the satisfaction of the Engineer. Cleanup of waste material must be continuous during the grooving operation. Flush debris produced by the machine to the edge of the grooved area or pick it up as it forms. The dust coating remaining shall be picked up or flushed to the edge of the area if the resultant accumulation is not detrimental to the vegetation or storm drainage system. Accomplish all flushing operations in a manner to prevent erosion on the shoulders or damage to vegetation. Waste material must be disposed of in an approved manner. Waste material must not be allowed to enter the airport storm sewer system. The Contractor must dispose of these wastes in strict compliance with all applicable state, local, and federal environmental statutes and regulations

621-2.9 Repair of damaged pavement. Grooving must be stopped and damaged pavement repaired at the Contractor's expense when directed by the Engineer.

ACCEPTANCE

621-3.1 Acceptance testing. Grooves will be accepted based on results of zone testing. All acceptance testing necessary to determine conformance with the groove tolerances specified will be performed by the Engineer.

Instruments for measuring groove width and depth must have a range of at least 0.5 inch and a resolution of at least 0.005 inch. Gauge blocks or gauges machined to standard grooves width, depth, and spacing may be used.

Instruments for measuring center-to-center spacing must have a range of at least 3 inches and a resolution of at least 0.02 inch.

The Engineer will measure grooves in five zones across the pavement width. Measurements will be made at least three times during each day's production. Measurements in all zones will be made for each cutting head on each piece of grooving equipment used for each day's production.

The five zones are as follows:

Zone 1	Centerline to 5 feet left or right of the centerline.
Zone 2	5 feet to 25 feet left of the centerline.
Zone 3	5 feet 25 feet right of the centerline.
Zone 4	25 feet to edge of grooving left of the centerline.
Zone 5	25 feet to edge of grooving right of the centerline.

At a random location within each zone, five consecutive grooves sawed by each cutting head on each piece of grooving equipment will be measured for width, depth, and spacing. The five consecutive measurements must be located about the middle blade of each cutting head ±4 inches. Measurements will be made along a line perpendicular to the grooves.

- Width or depth measurements less than 0.170 inch shall be considered less than 3/16 inch.
- Width or depth measurements more than 0.330 inch shall be considered more than 5/16 inch.
- Width or depth measurements more than 0.235 inch shall be considered more than 1/4 inch.

Production must be adjusted when more than one groove on a cutting head fails to meet the standard depth, width, or spacing in more than one zone.

METHOD OF MEASUREMENT

621-4.1 The quantity of grooving to be paid for shall be the number of square yards of grooving performed in accordance with the specifications and accepted by the Engineer per paragraph 621-3.1.

BASIS OF PAYMENT

621-5.1 Payment for saw-cut grooving. Payment for saw-cut grooving will be made at the contract unit price per square yard for saw-cut grooving. This price shall be full compensation for furnishing all materials, and for all preparation, delivering, and application of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

ITEM NO.	ITEM	UNIT
02621.1	Saw-Cut Grooves	Square Yard

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

Advisory Circulars (AC)

AC 150/5320-12 Measurement, Construction, and Maintenance of Skid Resistant Airport Pavement Surfaces

END OF ITEM P-621

--------END OF SECTION 02621-------

SECTION 02623 – EMULSIFIED ASPHALT SPRAY SEAL COAT

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. The General Provision of the contract, including the General Provisions for Construction Projects (2016), Special Provisions, and General Requirements of the Specifications, apply to the work specified in this section. This Section shall be in accordance with FAA Specification Item P-623: Emulsified Asphalt Spray Seal Coat, as included as an attachment to this Section.

1.2 DESCRIPTION OF WORK

A. This Section consists of the application of a polymer modified, asphalt emulsion spray seal coat (seal coat) composed of an emulsion of binders prepared from crude petroleum, mineral fillers, water and polymer, applied to taxiways, shoulders, overruns, roads, parking areas, and other general applications. It shall not be applied to Runways. The seal coat shall be applied in accordance with these specifications, and as shown on the plans or as directed by the Engineer.

1.3 RELATED WORK SPECIFIED ELSEWHERE (Not Used)

1.4 REFERENCES

A. Federal Aviation Administration (FAA)

1. FAA Specification Item P-623: Emulsified Asphalt Spray Seal Coat.

1.5 SUBMITTALS

A. Certificate of Analysis (COA) for material delivered to the project

PART 2 - PRODUCTS

2.1 Polymer modified asphalt emulsion spray seal (seal coat).: in accordance with FAA Specification Item P-623, paragraph 623-2.1.

PART 3 - EXECUTION

3.1 Construction methods shall be in accordance with FAA Specification Item P-623.

3.2 Acceptance shall be in accordance with FAA Specification Item P-623.

PART 4 - MEASUREMENT AND PAYMENT

4.1 METHOD OF MEASUREMENT

A. Method of measurement and payment shall be in accordance with FAA Specification Item P-623, paragraph 623-2.1.

4.2 BASIS OF PAYMENT

A. Basis for payment shall be in accordance with FAA Specification Item P-623, paragraph 623-7.1.

PART 5 - ATTACHMENTS

5.1 FAA Specification Item P-623 Emulsified Asphalt Spray Seal Coat.

Item P-623 Emulsified Asphalt Spray Seal Coat

DESCRIPTION

623-1.1 This item shall consist of the application of a polymer modified, asphalt emulsion spray seal coat (seal coat) composed of an emulsion of binders prepared from crude petroleum, mineral fillers, water and polymer, applied to an existing, previously prepared asphalt surface. The seal coat shall be applied in accordance with these specifications, and as shown on the plans or as directed by the Engineer.

623-1.2 Application rate per square yard. The approximate amounts of seal coat per square yard for the spray seal will be applied as provided in the Application Rate Table. The actual application rates will vary within the range specified to suit field conditions and will be recommended by the manufacturer's representative and approved by the Engineer from the test area/sections evaluation.

Application Rate (gal/yd^2/coat)

	2-coat application	3-coat application
1st Coat	0.14 - 0.20	0.14 - 0.20
2nd Coat	0.10 - 0.20	0.10 - 0.20
3rd Coat	-	0.08 - 0.15
Total Application	0.30 minimum	0.30 – 0.55

MATERIALS

623-2.1 Polymer modified asphalt emulsion spray seal (seal coat). A seal coat fortified with fillers created from binders prepared from crude petroleum shall meet the properties in the following table:

Polymer Modified Asphalt Emulsion Spray Seal Properties[1]

Property	Characteristics	
	Minimum	Maximum
Density at 77°F (25°C), lb./gal (g/mL)	9 (1.0)	12 (1.5)
Residue by evaporation, %	44	…
Water content, %	…	56
Ash content of residue, %	30	40
Uniformity	Uniform homogeneous consistency.	
Wet film continuity	No separation, coagulation, or settlement that cannot be overcome by moderate agitation.	
Resistance to heat	No blistering, sagging, or slipping.	
Resistance to water	No loss of adhesion and no blistering or tendency to re-emulsify.	
Flash point	No tendency to flash.	
Flexibility	No flaking, cracking, or loss of adhesion to the substrate.	
Polymer modification	Minimum 3% by weight of asphalt binder.	

[1] For water content testing, use ASTM Test Method D95. For flash point testing, use ASTM Test Method D93. For other properties, use ASTM Test Methods D2939.

The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for material delivered to the project. If the asphalt emulsion is diluted at other than the manufacturer's facility, the Contractor shall provide a supplemental COA from an independent laboratory verifying the asphalt emulsion properties. The COA shall be provided to and approved by the Engineer before material is applied. The furnishing of the vendor's certified test report for the asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

623-2.2 Polymer modification. The type of polymer used for modification shall be chosen by the manufacturer. The polymer modifier shall be incorporated in the manufacturing process. The Contractor shall submit manufacturer's technical data, the manufacturer's certification indicating that the polymer meets the requirements of the specification, and the manufacturer's approval of its use to the engineer. The amount of polymer will be a minimum 3% of the weight of the asphalt binder in the seal coat surface treatment.

623-2.3 Water. Water used in mixing or curing shall be from potable water sources, free of harmful soluble salts, and at least 50°F (10°C). Other sources shall be tested in accordance with ASTM C1602 prior to use.

623-2.4 Friction characteristics. Not required.

CONSTRUCTION METHODS

623-4.1 Worker safety. The Contractor shall obtain a Safety Data Sheet (SDS) for both the asphalt sealer product and aggregate and require workmen to follow the manufacturer's recommended safety precautions. All additional industry standard safety precautions regarding the storage and applications of asphalts should be understood and followed by the Contractor.

623-4.2 Control strip. Prior to full production the Contractor shall construct a control strip. The test area will be designated by the Engineer in an area representative of the project. The control strip will determine the application rate to be used as well as to demonstrate the equipment and placement methods to be used. If the control strip should prove to be unsatisfactory, the necessary adjustments to the mix composition, application rate, placement operations and equipment shall be made. Additional control strips shall be placed and evaluated if required. Full production shall not begin without the Engineer's or manufacturer's representative approval of an appropriate application rate.

623-4.3 Weather limitations. The spray seal shall be applied only when the existing pavement surface is dry and when the weather is not foggy, rainy, or the humidity will not allow proper curing, or when the wind velocity will prevent the uniform application of the material. No material shall be applied when dust or sand is blowing or when rain is anticipated within eight (8) hours of application completion. The atmospheric temperature and the pavement surface temperature shall both be above 50°F (10°C) and rising and is expected to remain above 50°F (10°C) for 24 hours, unless otherwise directed by the Engineer. Cover existing buildings, structures, runway edge lights, taxiway edge lights, informational signs, retro-reflective marking and in-pavement duct markers as necessary to protect against overspray before applying the emulsion. Should emulsion get on any light or marker fixture, promptly clean the fixture. If cleaning is not satisfactory to the Engineer, the Contractor shall replace any light, sign or marker with equivalent equipment at no cost to the Owner.

623-4.3 Equipment and tools. The Contractor shall furnish all equipment, tools, and machinery necessary for the performance of the work. Equipment used to apply the seal coat shall have continuous agitation or mixing capabilities to maintain homogeneous consistency of the seal coat throughout the application process. Spray equipment shall be capable of mixing and spraying seal coat with aggregate added. Self-propelled squeegee equipment with mixing capability shall have at least two squeegee or brush devices (one behind the other) to ensure adequate distribution and penetration of seal coat surface treatment into pavement surface. Hand squeegees and brushes shall be acceptable in areas where practicality prohibits the use of mechanized equipment. A power broom or blower may be used for removing loose material from the surface to be treated.

623-4.4 Preparation of asphalt pavement surfaces. Clean pavement surface immediately prior to placing the seal coat so that it is free of dust, dirt, grease, vegetation, oil or any type of objectionable surface film. Remove oil or grease by scrubbing with a detergent, then wash thoroughly with clean water. Any additional surface preparation, such as crack repair, shall be in accordance with specification section 02562 Surface Preparation and Crack Sealing.

a. New asphalt pavement surfaces. Allow new asphalt pavement surfaces to cure so that there is no concentration of oils on the surface. A period of at least 30 days at 70°F (21°C) daytime temperatures shall elapse between the placement of a hot mixed asphalt concrete surface course and the application of the seal coat.

Perform a water-break-free test to confirm that the surface oils have degraded and dissipated. (Cast approximately one gallon (4 liters) of clean water out over the surface. The water should sheet out and wet the surface uniformly without crawling or showing oil rings.) If signs of crawling or oil rings are apparent on the pavement surface, additional time must be allowed for additional curing and retesting of the pavement surface prior to treatment.

623-4.5 Emulsion mixing.

Contractor must ensure the mixture is homogeneous with no balling or lumping. Continue to agitate the seal coat mixture in the mixing tank at all times prior to and during application so that a consistent mix is available for application. Small additional increments of water may be needed to provide a workable consistency, but in no case is the water content to exceed the specified amount.

623-4.6 Application of seal coat. Application of seal coat generally consists of two application coats of material. The first coat must be dry prior to the application of the second coat or subsequent coats if more than two coats are being applied. During all applications, the surfaces of adjacent structures shall be protected to prevent their being spattered or marred. Should the seal coat get on any light or marker fixture, promptly clean the fixture. If cleaning is not satisfactory to the Engineer, the Contractor shall replace any light, sign or marker with equivalent equipment at no cost to the Owner.

Traffic shall not be allowed until the seal coat has thoroughly cured for approximately 24 hours, or as otherwise directed by the Engineer or manufacturer's representative.

If low spots and depressions greater than 1/2 inch (12 mm) in depth in the pavement surface cause ponding or puddling of the applied materials, the pavement surface shall be broomed with a broom drag. Brooming shall continue until the pavement surface is free of any pools of excess material. The Engineer shall inspect and approve areas after brooming.

623-4.7 Freight and weigh bills. The Contractor shall submit waybills and delivery tickets during the progress of the work. Before the final estimate is allowed, file with the Engineer certified waybills and certified delivery tickets for all seal coat used in the construction of the pavement covered by the contract. Do not remove seal coat from storage until the initial outage and temperature measurements have been taken. The delivery or storage units will not be released until the final outage has been taken.

MATERIAL ACCEPTANCE

623-5.1 Application rate. The rate of application of the asphalt emulsion shall be verified at least twice per day. The Contractor must furnish the Engineer the results daily.

METHOD OF MEASUREMENT

623-6.1 Asphalt seal coat. The quantity of seal coat shall be measured by the square yards of material applied in accordance with the plans and specifications and accepted by the Engineer.

BASIS OF PAYMENT

623-7.1 Payment shall be made at the contract unit price per square yard for the seal coat applied and accepted by the Engineer. This price shall be full compensation for all surface preparation, furnishing all materials, delivery and application of these materials, for all labor, equipment, tools, and incidentals necessary to complete the item control strip.

Payment will be made under:

ITEM NO.	ITEM	UNIT
02623.1	Emulsified Asphalt Spray Seal Coat	Square Yard

REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM International (ASTM)

ASTM C1602 Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete

ASTM D93	Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester
ASTM D95	Standard Test Method for Water in Petroleum Products and Bituminous Materials by Distillation
ASTM D2939	
ASTM D5340	Standard Test Method for Airport Pavement Condition Index Surveys
	Advisory Circulars (AC)
AC 150/5380-7	Airport Pavement Management Program (PMP)
	Code of Federal Regulations (CFR)
29 CFR 1910.1200	Occupational Safety and Health Standards, Toxic and Hazardous Substances, Hazard Communication

40 CFR – Protection of Environment.

END OF ITEM P-623

Requirements of Chapter 104, HRS
Wages and Hours of Employees on Public Works Law

Chapter 104, HRS, applies to every public works construction project over $2,000, regardless of the method of procurement or financing (purchase order, voucher, bid, contract, lease arrangement, warranty, SPRB).

Rate of Wages for Laborers and Mechanics

- Minimum prevailing wages (basic hourly rate plus fringe benefits), as determined by the Director of Labor and Industrial Relations and published in wage rate schedules, shall be paid to the various classes of laborers and mechanics working on the job site. [§104-2(a), (b), Hawaii Revised Statutes (HRS)]

- If the Director of Labor determines that prevailing wages have increased during the performance of a public works contract, the rate of pay of laborers and mechanics shall be raised accordingly. [§104-2(a) and (b), HRS; §12-22-3(d) Hawaii Administrative Rules (HAR)]

Overtime

- Laborers and mechanics working on a Saturday, Sunday, or a legal holiday of the State or more than eight hours a day on any other day shall be paid overtime compensation at not less than one and one-half times the basic hourly rate plus the cost of fringe benefits for all hours worked. If the Director of Labor determines that a prevailing wage is defined by a collective bargaining agreement, the overtime compensation shall be at the rates set by the applicable collective bargaining agreement [§§104-1, 104-2(c), HRS; §12-22-4.1, HAR]

Weekly Pay

- Laborers and mechanics employed on the job site shall be paid their full wages at least once a week, without deduction or rebate, except for legal deductions, within five working days after the cutoff date. [§104-2(d), HRS]

Posting of Wage Rate Schedules

- Wage rate schedules with the notes for prevailing wages and special overtime rates, shall be posted by the contractor in a prominent and easily accessible place at the job site. A copy of the entire wage rate schedule shall be given to each laborer and mechanic employed under the contract, except when the employee is covered by a collective bargaining agreement. [§104-2(d), HRS]

Withholding of Accrued Payments

- If necessary, the contracting agency may withhold accrued payments to the contractor to pay to laborers and mechanics employed by the contractor or subcontractor on the job site any difference between the wages required by the public works contract or specifications and the wages received. [§104-2(e), HRS]

Certified Weekly Payrolls and Payroll Records

- A certified copy of all payrolls shall be submitted weekly to the contracting agency. [§104-3(a), HRS; §12-22-10, HAR]

- The contractor is responsible for the submission of certified copies of the payrolls of all subcontractors. The certification shall affirm that the payrolls are correct and complete, that the wage rates listed are not less than the applicable rates contained in the applicable wage rate schedule, and that the classifications for each laborer or mechanic conform with the work the laborer or mechanic performed. [§104-3(a), HRS; §12-22-10, HAR]

- Payroll records shall be maintained by the contractor and subcontractors for three years after completion of construction. The records shall contain: [§104-3(b), HRS; §12-22-10, HAR]
  - the name and home address of each employee
  - the last four digits of social security number
  - a copy of the apprentice's registration with DLIR
  - the employee's correct classification
  - rate of pay (basic hourly rate + fringe benefits)
  - itemized list of fringe benefits paid
  - daily and weekly hours worked
  - weekly straight time and overtime earnings
  - amount and type of deductions
  - total net wages paid
  - date of payment

- Records shall be made available for examination by the contracting agency, the Department of Labor and Industrial Relations (DLIR), or any of its authorized representatives, who may also interview employees during working hours on the job. [§§104-3(c), 104-22(a), HRS; §12-22-10, HAR]

Termination of Work on Failure to Pay Wages

- If the contracting agency finds that any laborer or mechanic employed on the job site by the contractor or any subcontractor has not been paid prevailing wages or overtime, the contracting agency may, by written notice to the contractor, terminate the contractor's or subcontractor's right to proceed with the work or with the part of the work in which the required wages or overtime compensation have not been paid. The contracting agency may complete this work by contract or otherwise, and the contractor or contractor's sureties shall be liable to the contracting agency for any excess costs incurred. [§104-4, HRS]

Apprentices

- Apprentice wage rates apply to contractors who are a party to a bona fide apprenticeship program which has been registered with the DLIR. In order to be paid apprentice rates, apprentices must be parties to an agreement either registered with or recognized as a USDOL nationally approved apprenticeship program by the DLIR, Workforce Development Division, (808) 586-8877, and the apprentice must be individually registered by name with the DLIR. [§12-22-6(1) and (2), HAR]

- The number of apprentices on any public work in relation to the number of journeyworkers in the same craft classification as the apprentices employed by the same employer on the same public work may not exceed the ratio allowed under the apprenticeship standards registered with or recognized by the DLIR. A registered or recognized apprentice receiving the journeyworker rate will not be considered a journeyworker for the purpose of meeting the ratio requirement. [§12-22-6(3), HAR]

Enforcement

- To ensure compliance with the law, DLIR and the contracting agency will conduct investigations of contractors and subcontractors. If a contractor or subcontractor violates the law, the penalties are: [§104-24, HRS]

  - First Violation — Equal to 25% of back wages found due or $250 per offense up to $2,500, whichever is greater.
  - Second Violation — Equal to amount of back wages found due or $500 for each offense up to $5,000, whichever is greater.
  - Third Violation — Equal to two times the amount of back wages found due or $1,000 for each offense up to $10,000, whichever is greater; and
    Suspension from doing any new work on any public work of a governmental contracting agency for three years.

  ▪ A violation would be deemed a second violation if it occurs within two years of the **first notification of violation**, and a third violation if it occurs within three years of **the second notification of violation**. [§104-24, HRS; §12-22-25(b), HAR]

  ▪ **Suspension**: For a first or second violation, the department shall immediately suspend a contractor who fails to pay wages or penalties until all wages and penalties are paid in full. For a third violation, the department shall penalize and suspend the contractor as described above, **except that if the contractor continues to violate the law, then the department shall immediately suspend the contractor for a mandatory three years. The contractor shall remain suspended until all wages and penalties are paid in full.** [§§104-24, 104-25, HRS]

- **Suspension**: Any contractor who fails to make payroll records accessible or provide requested information within 10 days, or fails to keep or falsifies any required record, shall be assessed a penalty including suspension as provided in Section 104-22(b) and 104-25(a)(3), HRS. [§104-3(c), HRS; §12-22-26, HAR]

- If any contractor interferes with or delays any investigation, the contracting agency shall withhold further payments until the delay has ceased. Interference or delay includes failure to provide requested records or information within ten days, failure to allow employees to be interviewed during working hours on the job, and falsification of payroll records. The department shall assess a penalty of $10,000 per project, and $1,000 per day thereafter, for interference or delay. [§104-22(b), HRS; §12-22-26, HAR]

- Failure by the contracting agency to include in the provisions of the contract or specifications the requirements of Chapter 104, HRS, relating to coverage and the payment of prevailing wages and overtime, is not a defense of the contractor or subcontractor for noncompliance with the requirements of this chapter. [§104-2(f), HRS]

For additional information, visit the department's website at *http://labor.hawaii.gov/wsd*
or contact any of the following DLIR offices:

Oahu (Wage Standards Division) .....(808) 586-8777
Hawaii Island.....(808) 974-6464
Maui and Kauai .....(808) 243-5322

PROPOSAL TO THE
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

PROJECT:	Repair of Asphalt Concrete Pavement at Kahului Airport Kahului, Maui, Hawaii
PROJECT NO.:	BM1642-33
CONTRACT TERM:	1,096 Calendar days from the date indicated in the Notice to Proceed from the Department.
PROJECT MANAGER:	Roger Ross Department of Transportation Airports Elison Onizuka Kona International Airport at Keahole 73200 Kupipi Street, Kailua Kona, HI 96740 Email: roger.r.ross@hawaii.gov Phone: (808)-895-2954
ELECTRONIC SUBMITTAL:	**Bidders shall submit and upload the complete proposal to HIePRO prior to the bid opening date and time. Any additional support documents explicitly designated as confidential and/or proprietary shall be uploaded as a separate file to HIePRO. See SPECIAL PROVISIONS 2.8 PREPARATION AND DELIVERY OF BID for complete details. FAILURE TO UPLOAD THE COMPLETE PROPOSAL TO HIePRO SHALL BE GROUNDS FOR REJECTION OF THE BID.**

Director of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813

Dear Sir:

The undersigned Bidder declares the following:

1. It has not, either directly or indirectly entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with this proposal.

2. It has not been assisted or represented on this matter by any individual who has, in a State capacity, been involved in the subject matter of this contract within the past two years.

3. It has not and will not, either directly or indirectly offered or given gratuity (i.e. an entertainment or gift) to any State or County employee to obtain a contract or favorable treatment under a contract.

The undersigned Bidder further agrees to the following:

1. If this proposal is accepted, it shall execute a contract with the Department to provide all necessary labor, machinery, tools, equipment, apparatus and any other means of construction, to do all the work and to furnish all the materials specified in the contract in the manner and within the time therein prescribed in the contract, and that it shall accept in full payment therefore the sum of the unit and/or lump sum prices as set forth in the attached proposal schedule for the actual quantities of work performed and materials furnished and furnish satisfactory security in accordance with Section 103D-324, Hawaii Revised Statutes, within 10 days after the award of the contract or within such time as the Director of Transportation may allow after the undersigned has received the contract documents for execution, and is fully aware that non-compliance with the aforementioned terms will result in the forfeiture of the full amount of the bid guarantee required under Section 103D-323, Hawaii Revised Statutes.

2. That the quantities given in the attached proposal schedule are approximate only and are intended principally to serve as a guide in determining and comparing the bids.

3. That the Department does not either expressly or by implication, agree that the actual amount of work will correspond therewith, but reserves the right to increase or decrease the amount of any class or portion of the work, or to omit portions of the work, as may be deemed necessary or advisable by the Director of Transportation, and that all increased or decreased quantities of work shall be performed at the unit prices set forth in the attached proposal schedule except as provided for in the specifications.

4. In case of a discrepancy between unit prices and the totals in said Proposal Schedule, the unit prices shall prevail.

5. Agrees to begin work within 10 working days after the date of notification to commence with the work, which date is in the notice to proceed, and shall finish the entire project within the time prescribed.

6. The Director of Transportation reserves the right to reject any or all bids and to waive any defects when in the Director's opinion such rejections or waiver will be for the best interest of the public.

The Bidder acknowledges receipt of and certifies that it has completely examined the following listed items: the Hawaii Department of Transportation, Air and Water Transportation Facilities Division General Provisions for Construction Projects dated 2016, the Notice to Bidders, the Special Provisions, if any, the Technical Provisions, the Proposal, the Contract and Bond Forms, and the Project Plans.

This proposal is accompanied with a bid security in the amount of $75,000.00, in the form checked below. (Check applicable bid security submitted with bid.)

_____ Surety Bid Bond (Use standard form),

_____ Cash,

_____ Cashier's Check,

_____ Certified Check, or

_____ _____.
(Fill in other acceptable security.)

The undersigned Bidder acknowledges receipt of any addendum issued by the Department by recording in the space below the date of receipt.

Addendum No. 1 _____ Addendum No. 3 _____

Addendum No. 2 _____ Addendum No. 4 _____

In accordance with Section 103D-302, Hawaii Revised Statutes, the undersigned as Bidder, has listed the name of each person or firm, who will be engaged by the Bidder on the project as a Subcontractor or Joint Contractor and the nature of work to be done by each. **The Bidder must adequately and unambiguously disclose the unique nature and scope of the work to be performed by each Subcontractor or Joint Contractor.** For each listed firm, the Bidder declares the respective firm is a Subcontractor or Joint Contractor and is subject to evaluation as a Subcontractor or Joint Contractor. It is understood that failure to comply with the aforementioned requirements may be cause for rejection of the bid submitted.

Name of Subcontractor	Nature and Scope of Work
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	

Name of Joint Contractor	Nature and Scope of Work
1.	
2.	
3.	

NOTES:
"None" or if left blank indicates no Subcontractor or Joint Contractor.
If more space is needed, attach additional sheets.

The undersigned hereby certifies that the bid prices contained in the attached proposal schedule have been carefully checked and are submitted as correct and final.

This declaration is made with the understanding that the undersigned is subject to the penalty of perjury under the laws of the United States and is in violation of the Hawaii Penal Code, Section 710-1063, unsworn falsification to authorities, of the Hawaii Revised Statutes, for knowingly rendering a false declaration.

_____
Bidder (Company Name)

By_____
Authorized Signature

_____
Print Name and Title

_____

_____
Business Address

_____ _____
Business Telephone Email

_____
Date

_____
Contact Person (If different from above)

Phone:_____ Email:_____

NOTE:

If Bidder is a CORPORATION, the legal name of the corporation shall be set forth above, the corporate seal affixed, together with the signature(s) of the officer(s) authorized to sign contracts for the corporation. Please attach to this page current (not more than six months old) evidence of the authority of the officer(s) to sign for the corporation.

If Bidder is a PARTNERSHIP, the true name of the partnership shall be set forth above, with the signature(s) of the general partner(s). Please attach to this page current (not more than six months old) evidence of the authority of the partner authorized to sign for the partnership.

If Bidder is an INDIVIDUAL, the bidder's signature shall be placed above.

If signature is by an agent, other than an officer of a corporation or a partner of a partnership, a POWER OF ATTORNEY must be on file with the Department before opening bids or submitted with the bid. Otherwise, the Department may reject the bid as irregular and unauthorized.

PREFERENCES

Bidders agree that preferences shall be taken into consideration to determine the low bidder in accordance with said Sections and the rules promulgated, however, the award of contract will be in the amount of the bid offered exclusive of any preferences.

A. HAWAII PRODUCTS PREFERENCE

In accordance with ACT 174, SLH 2022, effective June 27, 2022, Hawaii Products Preference shall not apply to solicitations for public works construction. Therefore, the Hawaii Products Preference shall not apply to this project.

B. APPRENTICESHIP PROGRAMS PREFERENCE

In accordance with ACT 17, SLH 2009 – Apprenticeship Program, a 5% bid adjustment for bidders that are parties to apprenticeship agreements pursuant to Hawaii Revised Statutes (HRS) Section 103-55.6 may be applied to the bidder's price for evaluation purposes.

Any bidder seeking this preference must be a party to an apprenticeship agreement registered with the Department of Labor and Industrial Relations at the time the offer is made for each apprenticeable trade the bidder will employ to construct the public works projects for which the offer is being made.

The bidder is responsible for complying with all submission requirements for registration of its apprenticeship program before requesting the preference.

( ) Yes, I wish to be considered for the Apprenticeship Programs Preference. I have included Certification Form(s) 1 with my bid.

C. RECYCLED PRODUCT PREFERENCE

Recycled product preference shall not apply to this proposal.

REPAIR OF ASPHALT CONCRETE PAVEMENT AT LIHUE AIRPORT

KAHULUI, MAUI, HAWAII

STATE PROJECT NO. BM1642-33

PROPOSAL SCHEDULE

Item No.	Description	Approx. Quantity	Unit	Unit Price	Total
01561.1	**Construction Site Pollution Controls (For 36 month contract period)**	ALLOW.	ALLOW.	ALLOW.	$ 50,000
01562.2	**Management of Contaminated Medias, Soil Disposal, and Soil Reuse**	ALLOW.	ALLOW.	ALLOW.	$ 20,000
02209.1	**Crushed Aggregate Base Course**				
02209.1-a	1 – 30 Cubic Yards	1	CY	$ _____	$ _____
02209.1-b	31 – 60 Cubic Yards	31	CY	$ _____	$ _____
02209.1-c	61 – 120 Cubic Yards	61	CY	$ _____	$ _____
02209.1-d	121 – 500 Cubic Yards	121	CY	$ _____	$ _____
02401.1	**Asphalt Mix Pavement**				
02401.1-a	1 – 50 Tons	1	TON	$ _____	$ _____
02401.1-b	51 – 200 Tons	51	TON	$ _____	$ _____
02401.1-c	201 – 400 Tons	201	TON	$ _____	$ _____
02401.1-d	401 – 600 Tons	401	TON	$ _____	$ _____
02415.1	**Asphalt Underlayer Geogrid**				
02415.1-a	1-500 Square Yards	1	SY	$ _____	$ _____
02415.1-b	501-1000 Square Yards	501	SY	$ _____	$ _____
02415.1-c	>1000 Square Yards	1001	SY	$ _____	$ _____
02416.1	**Asphalt Interlayer Grid (GG 8511TF)**				
02416.1-a	1-500 Square Yards	1	SY	$ _____	$ _____
02416.1-b	501-1000 Square Yards	501	SY	$ _____	$ _____
02416.1-c	>1000 Square Yards	1001	SY	$ _____	$ _____
02416.2	**Asphalt Interlayer Grid (GG 8512TF)**				
02416.2-a	1-500 Square Yards	1	SY	$ _____	$ _____
02416.2-b	501-1000 Square Yards	501	SY	$ _____	$ _____
02416.2-c	>1000 Square Yards	1001	SY	$ _____	$ _____
02417.1	**Rapid Repair Asphalt Interlayer Grid**				
02417.1-a	1-500 Square Yards	1	SY	$ _____	$ _____
02417.1-b	501-1000 Square Yards	501	SY	$ _____	$ _____
02417.1-c	>1000 Square Yards	1001	SY	$ _____	$ _____
02418.1	**Rapid Repair Asphalt Interlayer Paving Mat**				
02418.1-a	1-500 Square Yards	1	SY	$ _____	$ _____
02418.1-b	501-1000 Square Yards	501	SY	$ _____	$ _____
02418.1-c	>1000 Square Yards	1001	SY	$ _____	$ _____

02562.1	**Herbiciding**				
02562.1-a	1 -500 Linear Foot	1	LF	$ _____	$ _____
02562.1-b	501 – 2000 Linear Foot	501	LF	$ _____	$ _____
02562.1-c	2001 – 5000 Linear Foot	2001	LF	$ _____	$ _____
02562.1-d	>5000 Linear Foot	5001	LF	$ _____	$ _____
02562.2	**Crack Sealing**				
02562.2-a	1 -500 Linear Foot	1	LF	$ _____	$ _____
02562.2-b	501 – 2000 Linear Foot	501	LF	$ _____	$ _____
02562.2-c	2001 – 5000 Linear Foot	2001	LF	$ _____	$ _____
02562.2-d	>5000 Linear Foot	5001	LF	$ _____	$ _____
02562.3	**Pavement Removal**				
02562.3-a	1 – 25 Cubic Yards	1	CY	$ _____	$ _____
02562.3-b	26 -100 Cubic Yards	26	CY	$ _____	$ _____
02562.3-c	101 – 200 Cubic Yards	101	CY	$ _____	$ _____
02562.3-d	201 – 300 Cubic Yards	201	CY	$ _____	$ _____
02608-1	**Rapid Cure Seal Coat**				
02608.1-a	1 – 500 Square Yards	1	SY	$ _____	$ _____
02608.1-b	501 – 1000 Square Yards	501	SY	$ _____	$ _____
02608.1-c	1001 – 2000 Square Yards	1001	SY	$ _____	$ _____
02608.1-d	>2000 Square Yards	2001	SY	$ _____	$ _____
02620.1	**Runway and Taxiway Marking**				
02620.1-a	1 – 500 Square Feet	1	SF	$ _____	$ _____
02620.1-b	501 – 2000 Square Feet	501	SF	$ _____	$ _____
02620.1-c	2001 – 5000 Square Feet	2001	SF	$ _____	$ _____
02620.1-d	>5000 Square Feet	5001	SF	$ _____	$ _____
02620.2	**Temporary Runway and Taxiway Marking**				
02620.2-a	1 – 500 Square Feet	1	SF	$ _____	$ _____
02620.2-b	501 – 2000 Square Feet	501	SF	$ _____	$ _____
02620.2-c	2001 – 5000 Square Feet	2001	SF	$ _____	$ _____
02620.2-d	>5000 Square Feet	5001	SF	$ _____	$ _____
02621.1	**Saw-Cut Grooves**				
02621.1-a	1 – 500 Square Yards	1	SY	$ _____	$ _____
02621.1-b	501 – 1000 Square Yards	501	SY	$ _____	$ _____
02621.1-c	1001 – 2000 Square Yards	1001	SY	$ _____	$ _____
02621.1-d	>2000 Square Yards	2001	SY	$ _____	$ _____
02623.1	**Emulsified Asphalt Spray Seal Coat**				
02623.1-a	1 – 500 Square Yards	1	SY	$ _____	$ _____
02623.1-b	501 – 1000 Square Yards	501	SY	$ _____	$ _____
02623.1-c	1001 – 2000 Square Yards	1001	SY	$ _____	$ _____
02623.1-d	>2000 Square Yards	2001	SY	$ _____	$ _____

TOTAL AMOUNT FOR COMPARISON OF BIDS $ _____

Bids shall include all applicable taxes and fees. The prices bid herein shall include all labor, materials, equipment, and incidentals necessary to construct all items in place, including installation and testing of equipment, complete and ready for operation, all in accordance with the plans and specifications.

Notes:

1. Bids shall include all Federal, State, County and other applicable taxes and fees.
2. The TOTAL AMOUNT FOR COMPARISON OF BIDS shall be used to determine the lowest responsible bidder.
3. Bidders shall complete all unit prices and amounts. Failure to do so shall be grounds for rejection of bid.
4. If a discrepancy occurs between unit bid price and the bid price, the unit bid price shall govern.
5. **Bidders shall submit and upload the complete proposal to HIePRO prior to the bid opening date and time. Proposals received after said due date and time shall not be considered. Any additional support documents explicitly designated as confidential and/or proprietary shall be uploaded as a separate file to HIePRO. Bidders shall not include confidential and/or proprietary documents with the proposal. The record of each bidder and respective bid shall be open to public inspection**. Original (wet ink, hard copy) proposal documents are not required to be submitted. **Contract award shall be based on evaluation of proposals submitted and uploaded to HIePRO.**

   FAILURE TO UPLOAD THE COMPLETE PROPOSAL TO HIePRO SHALL BE GROUNDS FOR REJECTION OF THE BID.

   If there is a conflict between the specification document and the HIePRO solicitation, the specifications shall govern and control, unless otherwise specified.

6. Any contract which is awarded shall be an open-ended contract since the exact value of work to be performed during the contract period cannot be determined beforehand. The unit price for each item of work on any particular work order shall be that which corresponds to the quantity of work for that item actually performed for each work order.
7. The quantities on the proposal schedule are for bidding purposes only, and this is no guarantee of the quantity of work that will be issued.
8. The State reserves the right to reject any or all Proposals and to waive any defects in the best interest of the State.
9. Submission of a Proposal is a warranty that the bidder has made an examination of the project site and is fully aware of all conditions to be encountered in performing the work and the requirements of the plans and specifications.
10. The bidder's attention is directed to Section 2.11 – BID SECURITY of the "General Provisions" as amended by the Special Provisions.
11. Bidders shall be paid for actual work performed as directed by the Engineer for allowance items. Bidder will not he paid overhead and profit for unused allowance funds.

SURETY BID BOND

Bond No. _____

KNOW ALL BY THESE PRESENTS:

That we, _____
(Full name or legal title of offeror)

as Offeror, hereinafter called the Principal, and

_____
(Name of bonding company)

as Surety, hereinafter called Surety, a corporation authorized to transact business as a Surety in the State of Hawaii, are held and firmly bound unto

_____
(State/county entity)

as Owner, hereinafter called Owner, in the penal sum of

_____
(Required amount of bid security)

Dollars ($_____), lawful money of the United States of America, for the payment of which sum well and truly to be made, the said Principal and the said Surety bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS:

The Principal has submitted an offer for _____

_____
(Project by number and brief description)

NOW, THEREFORE:

The condition of this obligation is such that if the Owner shall reject said offer, or in the alternate, accept the offer of the Principal and the Principal shall enter into a contract with the Owner in accordance with the terms of such offer, and give such bond or bonds as may be specified in the solicitation or Contract Documents with good and sufficient surety for the faithful performance of such Contract and for the prompt payment of labor and material furnished in the prosecution thereof as specified in the solicitation then this obligation shall be null and void, otherwise to remain in full force and effect.

Signed this _____ day of _____, _____

(Seal) _____
Name of Principal (Offeror)

_____
Signature

_____
Title

(Seal) _____
Name of Surety

_____
Signature

_____
Title

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

AIRPORTS

SAMPLE FORMS

CONTRACT

THIS AGREEMENT, made this day of _____, by and between the STATE OF HAWAII, by its Director of Transportation, hereinafter referred to as "STATE", and «CONTRACTOR», «STATE_OF_INCORPORATON», whose business/post office address is «ADDRESS», hereinafter referred to as CONTRACTOR";

WITNESSETH: That for and in consideration of the payments hereinafter mentioned, the CONTRACTOR hereby covenants and agrees with the STATE to complete in place, furnish and pay for all labor and materials necessary for "«PROJECT_NAME_AND_NO»", or such a part thereof as shall be required by the STATE, the total amount of which labor, material and construction shall be computed at the unit and/or lump sum prices set forth in the attached proposal schedule and shall be the sum of «BASIC»----DOLLARS ($«BASIC_NUMERIC») as follows:

TOTAL AMOUNT FOR COMPARISON OF BIDS……$«BASIC_NUMERIC»

which sum shall be provided from State funds, all in accordance with the specifications, the special provisions, if any, the notice to bidders, the instructions to bidders, the proposal and plans for «PROJECT_NO_ONLY», and any supplements thereto, on file in the office of the Director of Transportation. These documents, together with all alterations, amendments, and additions thereto and deductions therefrom, are attached hereto or incorporated herein by reference and made a part of this contract.

The CONTRACTOR hereby covenants and agrees to complete such construction within «WORKING_DAYS» from the date indicated in the Notice to Proceed from the State subject, however, to such extensions as may be provided for in writing under the specifications.

For and in consideration of the covenants, undertakings and agreements of the CONTRACTOR herein set forth and upon the full and faithful performance thereof by the CONTRACTOR, the STATE hereby agrees to pay the CONTRACTOR the sum of «BASIC»---DOLLARS ($«BASIC_NUMERIC») in lawful money, but not more than such part of the same as is actually earned according to the STATE's determination of the actual quantities of work performed and materials furnished by the CONTRACTOR at the unit or lump sum prices set forth in the attached proposal schedule. Such payment, including any extras, shall be made, subject to such additions or deductions hereto or hereafter made in the manner and at the time prescribed in the specifications and this contract.

An additional sum of «EXTRAS»-----DOLLARS ($«EXTRA_NUMERIC») is hereby provided for extra work.

All words used herein in the singular shall extend to and include the plural. All words used in the plural shall extend to and include the singular. The use of any gender shall extend to and include all genders.

IN WITNESS WHEREOF, the parties hereto have caused this instrument to be duly executed the day and year first above written.

STATE OF HAWAII

_____
Director of Transportation

«CONTRACTOR» (Seal)

_____
Signature

_____
Print name

_____
Print Title

_____
Date

PERFORMANCE BOND (SURETY)
(6/21/07)

KNOW TO ALL BY THESE PRESENTS:

That _____,
(Full Legal Name and Street Address of Contractor)

as Contractor, hereinafter called Principal, and _____

_____
(Name and Street Address of Bonding Company)

as Surety, hereinafter called Surety, a corporation(s) authorized to transact business as a surety in the State of Hawaii, are held and firmly bound unto the _____,
(State/County Entity)

its successors and assigns, hereinafter called Obligee, in the amount of _____

_____
DOLLARS ($_____), to which payment Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above-bound Principal has signed a Contract with Obligee on _____, for the following project:_____
_____
_____
_____
_____
_____
hereinafter called Contract, which Contract is incorporated herein by reference and made a part hereof.

NOW THEREFORE, the condition of this obligation is such that:

If the Principal shall promptly and faithfully perform, and fully complete the Contract in strict accordance with the terms of the Contract as said Contract may be modified or amended from time to time; then this obligation shall be void; otherwise to remain in full force and effect.

Surety to this Bond hereby stipulates and agrees that no changes, extensions of time, alterations, or additions to the terms of the Contract, including the work to be performed thereunder, and the specifications or drawings accompanying same, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such changes, extensions of time, alterations, or additions, and agrees that they shall become part of the Contract.

In the event of Default by the Principal, of the obligations under the Contract, then after written Notice of Default from the Obligee to the Surety and the Principal and subject to the limitation of the penal sum of this bond, Surety shall remedy the Default, or take over the work to be performed under the Contract and complete such work, or pay moneys to the Obligee in satisfaction of the surety's performance obligation on this bond.

Signed this _____ day of _____, _____.

(Seal) _____
Name of Principal (Contractor)

* _____
Signature

_____
Title

(Seal) _____
Name of Surety

* _____
Signature

_____
Title

*ALL SIGNATURES MUST BE ACKNOWLEDGED
BY A NOTARY PUBLIC

PERFORMANCE BOND

KNOW TO ALL BY THESE PRESENTS:

That we, _____
(full legal name and street address of Contractor)

as Contractor, hereinafter called Contractor, is held and firmly bound unto the

_____
(State/County entity)

its successors and assigns, as Obligee, hereinafter called Obligee, in the amount

_____DOLLARS $_____),
(Dollar amount of Contract)

lawful money of the United States of America, for the payment of which to the said Obligee, well and truly to be made, Contractor binds itself, its heir, executors, administrators, successors and assigns, firmly by these presents. Said amount is evidenced by:

☐ **Legal Tender**;

☐ **Share Certificate** unconditionally assigned to or made payable at sight to _____
Description:_____;

☐ **Certificate of Deposit**, No. _____, dated _____ issued by _____ drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

☐ **Cashier's Check** No. _____, dated _____ drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

☐ **Teller's Check** No. _____, dated _____ drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

☐ **Treasurer's Check** No. _____, dated _____ drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

☐ **Official Check** No. _____, dated _____ drawn on _____ a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

☐ **Certified Check** No. _____, dated _____ accepted by a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

WHEREAS:

The Contractor has by written agreement dated _____ entered into a contract with Obligee for the following Project:_____

_____

hereinafter called Contract, which Contract is incorporated herein by reference and made a part hereof.

NOW THEREFORE,

The Condition of this obligation is such that, if Contractor shall promptly and faithfully perform the Contract in accordance with, in all respects, the stipulations, agreements, covenants and conditions of the Contract as it now exists or may be modified according to its terms, and shall deliver the Project to the Obligee, or to its successors or assigns, fully completed as in the Contract specified and free from all liens and claims and without further cost, expense or charge to the Obligee, its officers, agents, successors or assigns, free and harmless from all suits or actions of every nature and kind which may be brought for or on account of any injury or damage, direct or indirect, arising or growing out of the doing of said work or the repair or maintenance thereof or the manner of doing the same or the neglect of the Contractor or its agents or servants or the improper performance of the Contract by the Contractor or its agents or servants or from any other cause, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

AND IT IS HEREBY STIPULATED AND AGREED that suit on this bond may be brought before a court of competent jurisdiction without a jury, and that the sum or sums specified in the said Contract as liquidated damages, if any, shall be forfeited to the Obligee, its successors or assigns, in the event of a breach of any, or all, or any part of, covenants, agreements, conditions, or stipulations contained in the Contract or in this bond in accordance with the terms thereof.

The amount of this bond may be reduced by and to the extent of any payment or payments made in good faith hereunder.

Signed and sealed this _____ day of _____, _____.

(Seal)_____
Name of Contractor

_____
Signature*

_____
Title

*ALL SIGNATURES MUST BE ACKNOWLEDGED
BY A NOTARY PUBLIC

LABOR AND MATERIAL PAYMENT BOND (SURETY)
(6/21/07)

KNOW TO ALL BY THESE PRESENTS:

That _____,
(Full Legal Name and Street Address of Contractor)

as Contractor, hereinafter called Principal, and _____

_____,
(Name and Street Address of Bonding Company)
as Surety, hereinafter called Surety, a corporation(s) authorized to transact business as a surety in the State of Hawaii, are held and firmly bound unto the _____,
(State/County Entity)

its successors and assigns, hereinafter called Obligee, in the amount of _____

_____
_____ Dollars ($_____), to which payment Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, the above-bound Principal has signed Contract with the Obligee on _____ for the following project:_____
_____
_____
_____
_____
hereinafter called Contract, which Contract is incorporated herein by reference and made a part hereof.

NOW THEREFORE, the condition of this obligation is such that if the Principal shall promptly make payment to any Claimant, as hereinafter defined, for all labor and materials supplied to the Principal for use in the performance of the Contract, then this obligation shall be void; otherwise to remain in full force and effect.

1. Surety to this Bond hereby stipulates and agrees that no changes, extensions of time, alterations, or additions to the terms of the Contract, including the work to be performed thereunder, and the specifications or drawings accompanying same, shall in any way affect its obligation on this bond, and it does hereby waive notice of any such changes, extensions of time, alterations, or additions, and agrees that they shall become part of the Contract.

2. A "Claimant" shall be defined herein as any person who has furnished labor or materials to the Principal for the work provided in the Contract.

Every Claimant who has not been paid amounts due for labor and materials furnished for work provided in the Contract may institute an action against the Principal and its Surety on this bond at the time and in the manner prescribed in Section 103D-324, Hawaii Revised Statutes, and have the rights and claims adjudicated in the action, and judgment rendered thereon; subject to the Obligee's priority on this bond. If the full amount of the liability of the Surety on this bond is insufficient to pay the full amount of the claims, then after paying the full amount due the Obligee, the remainder shall be distributed pro rata among the claimants.

Signed this _____ day of _____, _____.

(Seal) _____
Name of Principal (Contractor)

* _____
Signature

_____
Title

(Seal) _____
Name of Surety

* _____
Signature

_____
Title

*ALL SIGNATURES MUST BE ACKNOWLEDGED
BY A NOTARY PUBLIC

LABOR AND MATERIAL PAYMENT BOND

KNOW ALL BY THESE PRESENTS:

That we, _____
(full legal name and street address of Contractor)

as Contractor, hereinafter called Contractor, is held and firmly bound unto _____
(State/County entity)

its successors and assigns, as Obligee, hereinafter called Obligee, in the amount

_____ DOLLARS ($_____),
(Dollar amount of Contract)

lawful money of the United States of America, for the payment of which to the said Obligee, well and truly to be made, Contractor binds itself, its heir, executors, administrators, successors and assigns, firmly by these presents. Said amount is evidenced by:

❒ **Legal Tender**;

❒ **Share Certificate** unconditionally assigned to or made payable at sight to_____
_____
Description: _____
_____

❒ **Certificate of Deposit, No.** _____, dated _____
issued by _____
drawn on _____
a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

❒ **Cashier's Check No.** _____, dated _____
drawn on _____
a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

❒ **Teller's Check No.** _____, dated _____
drawn on _____
a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

❒ **Treasurer's Check No.** _____, dated _____
drawn on _____
a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

❒ **Official Check No.** _____, dated _____
drawn on _____
a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

❒ **Certified Check No.** _____, dated _____
accepted by a bank, savings institution or credit union insured by the Federal Deposit Insurance Corporation or the National Credit Union Administration, payable at sight or unconditionally assigned to _____;

WHEREAS:

The Contractor has by written agreement dated _____ entered into a contract with Obligee for the following Project:_____

_____

hereinafter called Contract, which Contract is incorporated herein by reference and made a part hereof.

NOW THEREFORE,

The condition of this obligation is such that, if Contractor shall promptly and faithfully perform the Contract in accordance with, in all respects, the stipulations, agreements, covenants and conditions of the Contract as it now exists or may be modified according to its terms, free from all liens and claims and without further cost, expense or charge to the Obligee, its officers, agents, successors or assigns, free and harmless from all suits or actions of every nature and kind which may be brought for or on account of any injury or damage, direct or indirect, arising or growing out of the doing of said work or the repair or maintenance thereof or the manner of doing the same or the neglect of the Contractor or its agents or servants or the improper performance of the Contract by the Contractor or its agents or servants or from any other cause, then this obligation shall be void; otherwise it shall be and remain in full force and effect.

AND IT IS HEREBY STIPULATED AND AGREED that suit on this bond may be brought before a court of competent jurisdiction without a jury, and that the sum or sums specified in the said Contract as liquidated damages, if any, shall be forfeited to the Obligee, its successors or assigns, in the event of a breach of any, or all, or any part of, covenants, agreements, conditions, or stipulations contained in the Contract or in this bond in accordance with the terms thereof.

AND IT IS HEREBY STIPULATED AND AGREED that this bond shall inure to the benefit of any and all persons entitled to file claims for labor performed or materials furnished in said work so as to give any and all such persons a right of action as contemplated by Sections 103D-324(d) and 103D-324(e), Hawaii Revised Statutes.

The amount of this bond may be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payments of mechanics' liens which may be filed of record against the Project, whether or not claim for the amount of such lien be presented under and against this bond.

Signed this _____ day of _____, _____.

(Seal) _____
Name of Contractor

* _____
Signature

_____
Title

*ALL SIGNATURES MUST BE
ACKNOWLEDGED BY A NOTARY PUBLIC

CHAPTER 104, HRS COMPLIANCE CERTIFICATE

The undersigned bidder does hereby certify to the following:

1. Individuals engaged in the performance of the contract on the job site shall be paid:

A. Not less than the wages that the director of labor and industrial relations shall have determined to be prevailing for corresponding classes of laborers and mechanics employed on public works projects; and

B. Overtime compensation at one and one-half times the basic hourly rate plus fringe benefits for hours worked on Saturday, Sunday, or a legal holiday of the State or in excess of eight hours on any other day.

2. All applicable laws of the federal and state governments relating to workers' compensation, unemployment compensation, payment of wages, and safety shall be fully complied with.

DATED at Honolulu, Hawaii, this _____ day of _____, 20___.

«CONTRACTOR»
Name of Corporation, Partnership, or Individual

Signature and Title of Signer

Notary Seal
NOTARY ACKNOWLEDGEMENT

Subscribed and sworn before me this
_____day of_____
Notary signature_____
Notary public, State of _____
My Commission Expires:_____

Notary Seal
NOTARY CERTIFICATION

Doc. Date: _____ #Pages: ____
Notary Name: _____ _____Circuit
Doc. Description: _____
_____
Notary signature_____
Date _____

PROVISIONS TO BE INCLUDED IN CONSTRUCTION PROCUREMENT SOLICITATIONS

1. Definitions for terms used in HRS Chapter 103B as amended by Act 192, SLH 2011:

   a. "Contract" means contracts for construction under 103D, HRS.

   b. "Contractor" has the same meaning as in Section 103D-104, HRS, provided that "contractor" includes a subcontractor where applicable.

   c. "Construction" has the same meaning as in Section 103D-104, HRS.

   d. "General Contractor" means any person having a construction contract with a governmental body.

   e. "Procurement Officer" has the same meaning as in Section 103D-104, HRS.

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

   g. "Shortage trade" means a construction trade in which there is a shortage of Hawai'i residents qualified to work in the trade as determined by the Department of Labor and Industrial Relations.

2. HRS Chapter 103B as amended by Act 192, SLH 2011–Employment of State Residents Requirements:

   a. A Contractor awarded a contract shall ensure that Hawai'i residents comprise not less than 80% of the workforce employed to perform the contract work on the project. The 80% requirement shall be determined by dividing the total number of hours worked on the contract by Hawai'i residents, by the total number of hours worked on the contract by all employees of the Contractor in the performance of the contract. The hours worked by any Subcontractor of the Contractor shall count towards the calculation for this section. The hours worked by employees within shortage trades, as determined by the Department of Labor and Industrial Relations (DLIR), shall not be included in the calculation for this section.

EXHIBIT 1

b. Prior to award of a contract, an Offeror/Bidder may withdraw an offer/bid without penalty if the Offeror/Bidder finds that it is unable to comply with HRS Chapter 103B as amended by Act 192, SLH 2011.

c. Prior to starting any construction work, the Contractor shall submit the subcontract dollar amount for each of its Subcontractors.

d. The requirements of this section shall apply to any subcontract of $50,000 or more in connection with the Contractor; that is, such Subcontractors must also ensure that Hawai'i residents comprise not less than 80% of the Subcontractor's workforce used to perform the subcontract.

e. The Contractor and any Subcontractor whose subcontract is $50,000 or more shall comply with the requirements of HRS Chapter 103B as amended by Act 192, SLH 2011.

1) Certification of compliance shall be made in writing under oath by an officer of the General Contractor and applicable Subcontractors and submitted with the final payment request.

2) The certification of compliance shall be made under oath by an officer of the company by completing a "Certification of Compliance for Employment of State Residents" form and executing the Certificate before a licensed notary public.

3) In addition to the certification of compliance as indicated above, the Contractor and Subcontractors shall maintain records such as certified payrolls for laborers and mechanics who performed work at the site and time sheets for all other employees who performed work on the project. These records shall include the names, addresses and number of hours worked on the project by all employees of the Contractor and Subcontractor who performed work on the project to validate compliance with HRS Chapter 103B as amended by Act 192, SLH 2011. The Contractor and Subcontractors shall retain these records and provide access to the State for a minimum period of four (4) years after the final payment, except that if any litigation, claim, negotiation, investigation, audit or other action involving the records has been started before the expiration of the four-year period, the Contractor and Subcontractors shall retain the records until completion of the action and resolution of all issues that arise from it, or until the end of the four-year period, whichever occurs later. Furthermore, it shall be the Contractor's responsibility to enforce compliance with this provision by any Subcontractor.

f. A General Contractor or applicable Subcontractor who fails to comply with this section shall be subject to any of the following sanctions:

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

2) Proceedings for debarment or suspension of the Contractor or Subcontractor under Hawai'i Revised Statues §103D-702.

3. Conflict with Federal Law: This section shall not apply if the application of this section is in conflict with any federal law, or if the application of this section will disqualify the State from receiving Federal funds or aid.

EXHIBIT 1

CERTIFICATION OF COMPLIANCE
FOR
EMPLOYMENT OF STATE RESIDENTS
HRS CHAPTER 103B, AS AMENDED BY ACT 192, SLH 2011

Project Title: _____

Agency Project No: _____

Contract No.: _____

As required by Hawai'i Revised Statutes Chapter103B, as amended by Act 192, Session Laws of Hawaii 2011–Employment of State Residents on Construction Procurement Contracts, I hereby certify under oath, that I am an officer of _____ and
(Name of Contractor or Subcontractor Company)
for the Project Contract indicated above, _____ was in
(Name of Contractor or Subcontractor Company)
compliance with HRS Chapter 103B, as amended by Act 192, SLH 2011, by employing a workforce of which not less than eighty percent are Hawai'i residents, as calculated according to the formula in the solicitation, to perform this Contract.

☐ I am an officer of the **Contractor** for this contract.

☐ I am an officer of a **Subcontractor** for this contract.

CORPORATE SEAL

_____
(Name of Company)

_____
(Signature)

_____
(Print Name)

_____
(Print Title)

Subscribed and sworn to me before this
_____ day of _____, 2011.

_____
Notary Public, 1st Circuit, State of Hawai'i
My commission expires: _____

Doc. Date: _____ # of Pages_____ 1st Circuit
Notary Name: _____
Doc. Description: _____
_____
_____

_____
Notary Signature Date
NOTARY CERTIFICATION

EXHIBIT 2