FAA ALASKA REGION
MODIFICATION OF AIRPORT STANDARDS

BACKGROUND ANC_2018_05674(CONDITIONAL)

Airport	Location (City, State)	LOC ID
ANC	ANCHORAGE, AK	PANC

Runway

Affected Taxiway/TDG

Design Aircraft (Each Runway/Taxiway) N/A, Applies to all ADOT airports, Statewide

AIP Grant Number

Passenger Charge Code (PFC)

MODIFICATION OF STANDARDS

AC Number	Chapter	Paragraph	Page Num
150/5370-10G	Flexible Base Course	all	1-6

Title of Standard Being Modified (Cite Reference Document)

Standards for Specifying Construction of Airports

AC Published Date

07/21/2014

EB Number

--

Title of Airport Engineering Brief

N/A

EB Published Date

Category Materials

Sub Category Other

Standard/Requirement

None, No FAA standard

Proposed P-310 Foamed Asphalt Stablized Base Course

See attachment

Explain Why Standard Cannot be Met (FAA ORDER 5300.1)

N/A, there is no FAA standard for foamed asphalt stabilized base course

Discuss Viable Alternatives (FAA ORDER 5300.1)

None

Explain Why the Modification is Necessary to Conform to Local Laws and Regulations (if Applicable)

Necessary for ADOT to set the material requirements and administer the construction contract

State Why Modification Would Provide Acceptable Level of Safety, Economy, Durability, and Workmanship (FAA ORDER 5300.1)

In the absence of an FAA standard for this element, this specification provides a standard for the material, and construction requirements. The specification requirements are based on accepted engineering principles to provide a durable product to meet its intended purpose.

Explain any Special Operational Procedures and/or Restrictions Necessary to Accommodate the Modification of Standards

Not applicable, there are none

SPONSOR

Full Name	Position	Date
Jefferson C Jeffers	Standard Specifications Engineer	09/28/2018

REGION

Date of Latest FAA Signed ALP

02/14/2017

Recommendation

Approval

Full Name	Position	Date
Kristi A Warden	Acting Div Director	10/03/2018

HEADQUARTERS

Recommendation

See Notes.

Full Name	Position	Date
Khalil Kodsi	Manager Airport Engineering Division	10/16/2018

POST APPROVAL

Effective Start Date	Effective End Date	Post Implementation Complete Date
10/16/2018	10/16/2023	

COORDINATION USERS

Date	Name	Coordination level	Concur

CONDITIONS

Date	Condition	ADO	RO
10/16/2018	Based on the purpose of this MOS as "Necessary for ADOT to set the material requirements and administer the construction contract" and information previously submitted for project MOS at BVC; Specification for Foamed Asphalt Stabilized Base Course (ITEM P-310) is approved with conditions.	Not required	Pat Zettler

10/16/2018	2) For each project used; the Geotech needs to establish strength of this material and supporting layers below; and a FAARFIELD design with design life of 20 years is required, with maximum User Defined (P-310) modulus of 100,000 psi.	Not required	Pat Zettler
10/16/2018	3) On each project this specification is used, document aggregate characteristics, aircraft use, test results for modulus when performed, and any other data into a database (i.e. simple excel worksheets) which will assist to validate modulus consistently exceeds 100,000 psi in varying conditions and design, and the specified requirements provide a base course which performs satisfactory for an acceptable time.	Not required	Pat Zettler
10/16/2018	1) Use of ITEM P-310 is approved for use on airports/pavements serving airplanes 60,000 lbs or less.	Not required	Pat Zettler

ITEM P-310 FOAMED ASPHALT STABILIZED BASE COURSE

DESCRIPTION

310-1.1 Construct a mixed-in-place foamed asphalt stabilized base course by uniformly mixing together reclaimed aggregate, foamed asphalt cement, portland cement and water. Spread, shape, and compact the mixed material in conformity to the dimensions and typical cross section shown on the plans. Build runway, taxiway, or aprons in a series of parallel lanes using a plan of processing that reduces longitudinal and transverse joints to a minimum.

Provide a technical representative on site during the development of the test section and during the entire production of foamed asphalt stabilized base course.

MATERIALS

310-2.1 ASPHALT CEMENT. Conform to the requirements shown in Table 1 when tested in accordance with AASHTO M 320.

TABLE 1: ASPHALT CEMENT

Property	Test Methods	Performance Grade Requirements
Performance Grading (Temp. range, Deg. C.)	AASHTO M 320	PG 52-28

Include the following with shipping documents:

a. Manufacturers certificate of compliance

b. Conformance test results of the batch

c. Manufacturer shall also certify:

(1) Date and Time of loading

(2) Batch number and storage tank

(3) Type, grade, temperature, and quantity of materials loaded

Furnish vendor's certified test reports for each lot of asphalt cement shipped to the project. The vendor's certified test report for the asphalt cement can be used for acceptance or tested independently by the Engineer.

310-2.2 PORTLAND CEMENT. Conform to the requirements of ASTM C150, Type I or II and include the low-alkali cement requirement shown in Table 2 of ASTM C150.

310-2.3 WATER. Use water that is clean and free from sewage, oil, acid, strong alkalies, or vegetable matter. Test water of questionable quality in accordance with the requirements of AASHTO T 26.

310-2.4 AGGREGATE. Use aggregate prepared from existing materials within the areas to be paved.

COMPOSITION

310-3.1 MIX DESIGN. At least 15 days prior to the production of foamed asphalt stabilized base course, furnish a representative 500-pound sample of in-place aggregate, 5-gallons of asphalt cement, and a sack of portland cement with appropriate certifications proposed for use. The Engineer will conduct laboratory tests of these

material samples to determine the quantity of asphalt cement and portland cement required in the mix and to determine the job mix design.

The foamed asphalt stabilized base course mix design will provide the following:

a. The percent of foamed asphalt cement to be added to the aggregate.

b. The percent water to be added to the asphalt cement during the foaming process.

c. The temperature of asphalt cement at the time of injection.

d. The percent portland cement added to the aggregate.

e. The gradation of the in-place aggregate.

f. The optimum moisture content for proper compaction and dispersion of foamed asphalt cement.

Should a change in sources of materials be made, a new job mix design will be established before the new material is used.

310-3.2 TEST SECTION. Prior to full production, use the equipment specified for the foamed asphalt stabilized base course operation and construct a test section at a location approved by the Engineer. Process material in the test section two passes wide, 150 feet long and to the depth shown on the plans. Ensure that the technical representative is on site to supervise the test section.

The Engineer will determine a relative standard density of the foamed asphalt stabilized base course on the test section using Alaska Test Method ATM 412, except that nuclear gauge tests will be taken in the direct transmission mode in accordance with ATM 213, Method A.

310-3.3 CONTRACTOR'S TECHNICAL REPRESENTATIVE. Provide an onsite technical representative to supervise the production of foamed asphalt stabilized base course. The technical representative is required to have successfully supervised at least five (5) successful projects using foamed asphalt cement with similar base material and equipment. Provide a submittal that includes the following information for each project supervised:

a. name of client contact, address, and telephone number

b. location of project

c. description of foamed asphalt cement equipment used on the project

Provide a technical representative that is also qualified to develop a foamed asphalt stabilized base course mix design and has access to laboratory equipment fitted with a foaming system exactly as the equipment to be used on the project. Submit this information at the preconstruction conference. Obtain the Engineer's approval of the proposed technical representative before construction of the foamed asphalt stabilized base course test section.

CONSTRUCTION METHODS

310-4.1 WEATHER LIMITATIONS. Do not mix foamed asphalt stabilized base course while the atmospheric temperature is below 40°F, when conditions indicate that the temperature may fall below 40°F within 24 hours, when the aggregate is above the optimum compaction moisture content, or when the aggregate or subgrade is frozen. Obtain the technical representative's approval of the weather conditions.

310-4.2 RECLAIMER. Use a reclaimer that has the following features and capabilities:

a. A minimum power capability of 600 horsepower.

b. The capability to excavate, mix and recycle material to the depth shown on the plans.

c. Ability to increase the effective volume of the mixing chamber in relation to depth of cut.

d. Two microprocessor controlled systems, complete with two independent pumping systems and spray bars, to regulate the application of foamed asphalt cement, separate from water that is used to increase the moisture content of the mixed material. Both systems perform in relation to the forward speed of the reclaimer and the mass of the material being processed.

e. Two spray bars, one for foamed asphalt cement and one for compaction moisture, each fitted with self cleaning nozzles at a maximum spacing of one nozzle for each 6 inch width of the mixing chamber.

f. The foamed asphalt cement is produced at the spray bar in individual expansion chambers into which both hot asphalt cement and water are injected under pressure through individual and small orifices that promote atomization. The rate of addition of water into the hot asphalt cement is kept at a constant percentage by mass of asphalt cement by the same microprocessor.

g. An inspection or test nozzle fitted at one end of the spray bar that produces a representative sample of foamed asphalt cement.

h. An electrical heating system capable of maintaining the temperature of asphalt cement flow components above 300 degrees F.

i. A single asphalt cement feed pipe installed between the recycler and the supply tanker. Do not use circulating systems that incorporate a return pipe to the supply tanker.

j. A system within the operator cabin to verify the foamed asphalt cement is being evenly distributed across the full width of the spray bar. Demonstrate the system to the Engineer to verify even spraying.

k. The ability to print out asphalt cement quantities used during production.

Propose a reclaimer model that has been successfully used on at least 5 other foamed asphalt stabilized base course projects. Provide a submittal that verifies the reclaimer specifications at the preconstruction conference. The Engineer must approve the reclaimer before construction of foamed asphalt stabilized base course test section.

310-4.3 PORTLAND CEMENT DISTRIBUTOR. Use a distributor that is designed to spread a uniform coverage of portland cement at a specified rate.

310-4.4 ROLLER. Provide the following rollers:

a. self-propelled vibratory pad foot roller having a minimum dynamic force of 60,000 lb;

b. pneumatic tired roller having a minimum operating weight of 50,000 lb; and

c. vibratory steel drum roller.

310-4.5 GRADER. Provide a grader with calibrated automatic cross slope blade controls.

310-4.6 PREPARATION. Grade and shape the area to be stabilized with foamed asphalt cement to conform to the grades and typical cross section shown on the plans. Determine the pre-processing grade in a manner that accounts for any swelling or shrinkage that will occur as a result of the reprocessing. If additional material is required to attain the levels shown on the plans, then use aggregate obtained from suitable embankment

material obtained and paid for under unclassified excavation. Remove any soft or yielding spots and replace with suitable material obtained and paid for under unclassified excavation.

310-4.7 PULVERIZATION. Pulverize the aggregate for the base course so that at the completion of moist-mixing, 100% by dry weight passes a 2-inch sieve, as determined by ATM 304.

310-4.8 FOAMED ASPHALT CEMENT AND PORTLAND CEMENT APPLICATION, MIXING, AND SPREADING. Accomplish the mixing of the foamed asphalt cement, portland cement, and water by the mixed-in-place method.

Ensure that the percentage of moisture in the aggregate, at the time of portland cement application, does not exceed the quantity that will permit a uniform mixture during mixing operations, and that it does not exceed the specified optimum moisture content for the foamed asphalt stabilized base course mixture.

Spread the specified quantity of portland cement uniformly on the aggregate. Replace portland cement that has been displaced before mixing is started. After the portland cement has been applied, use the reclaimer to mix it with the aggregate while simultaneously injecting foamed asphalt cement and compaction water. Continue mixing until the foamed asphalt cement, portland cement, and compaction water has been sufficiently blended with the aggregate.

310-4.9 COMPACTION. Immediately upon completion of the mixing operations, thoroughly compact the mixture. Accomplish the initial compaction with the vibratory pad foot roller. Accomplish intermediate compaction with the pneumatic tired roller. Accomplish finish compaction with the vibratory steel drum roller.

Ensure that the compacted mixture has a field density of at least 98 percent of the relative standard density obtained from the test section. Additional control strips may be required if there are changes in the material. The in-place field density will be determined by direct transmission in accordance with ATM 213, Method A. Ensure that the moisture content of the mixture at the start of compaction is not below or more than 2 percentage points above the optimum moisture content as determined by the foamed asphalt stabilized base course mix design.

310-4.10 FINISHING. Provide a completed foamed asphalt stabilized base course that conforms to the required lines, grades, and cross section. If necessary, lightly scarify the surface to eliminate any deep imprints made by the compacting or shaping equipment and recompact the surface to the required density.

310-4.11 CONSTRUCTION LIMITATIONS. When any of the operations after the application of cement are interrupted for more than 30 minutes or when the uncompacted mixture is wetted by rain so that the optimum moisture content is exceeded by 2 percentage points, reconstruction of the affected portion may be required at the Engineer’s discretion. In the event the uncompacted, rain-wetted mixture exceeds the specified moisture content tolerance, reconstruct the affected portion at your expense. At your expense, reconstruct all material along the longitudinal or transverse construction joints that is not properly compacted using properly moistened and mixed foamed asphalt stabilized base compacted to specified density.

310-4.12 SURFACE TESTS. Provide a finished surface that does not vary more than 3/8 inch when tested with a 12-foot straightedge applied parallel with, or at right angles to, the longitudinal axis of the pavement. Correct any variations in excess of this tolerance at your expense, and in a manner satisfactory to the Engineer.

310-4.13 THICKNESS. The thickness of the foamed asphalt stabilized base course will be determined from measurements of cores drilled from the finished base or from thickness measurements at holes drilled in the base at intervals so that each test shall represent no more than 5000 square yards. Provide an average thickness of the base constructed during one day that is within ½ inch of the thickness shown on the plans, except that the thickness of any one point may be within 3/4 inch of that shown on the plans. Where the average thickness shown by the measurements made in one day's construction is not within the tolerance given, the Engineer may direct reconstruction at your expense. Patch all core holes within 24 hours using material approved by the Engineer.

310-4.14 MAINTENANCE AND REPAIR. Maintain the entire base course in a condition satisfactory to the Engineer. Maintenance includes immediate repairs of any defects that may occur either before or after the foamed asphalt stabilized base course has been constructed. Repeat maintenance as often as necessary to keep the area intact at all times. Make repairs in a manner that will insure restoration of a uniform surface without compromising the durability of the part repaired. Reconstruct faulty work to the full depth of treatment. Reconstruct low areas by removing and replacing the material for the full depth of treatment rather than by adding a thin layer of foamed asphalt stabilized base course to the completed work.

METHOD OF MEASUREMENT

310-5.1 FOAMED ASPHALT STABILIZED BASE COURSE. The quantity of foamed asphalt stabilized base course to be paid for will be the number of square yards of completed and accepted base course.

310-5.2 ASPHALT CEMENT. The weight to be paid for will be the number of tons of asphalt cement used in the accepted foamed asphalt stabilized base determined by one of the following. The Engineer will select in writing the procedure to be used.

a. Supplier's invoices minus waste, diversion and excess left over. This method may be used on projects where deliveries are made in sealed tankers and the material for one project only. Method b. will be used to compute left over. Waste and diversion will be computed in a manner to be determined by the Engineer. All excess asphalt cement remains your property and will not be measured for payment.

b. Volume measure (tank sticking) of actual daily uses. It is the Contractor's responsibility to notify the Engineer whenever material is to be added to the calibrated volume measure or whenever material from the volume measure is to be used for work other than that specified in this contract.

Whichever method is used must be used for the duration of the project. Another method may be used and computed as a check, but only one method will be used for payment computation.

310-5.3 PORTLAND CEMENT. Portland cement will be measured by the ton from supplier’s invoices minus waste, diversion, and left over.

BASIS OF PAYMENT

310-6.1 FOAMED ASPHALT STABILIZED BASE COURSE. At the contract unit price per square yard as full compensation for furnishing all materials, except asphalt cement or portland cement, and for all preparation, delivering, placing, and mixing of these materials; and for all labor, equipment, tools and incidentals necessary to complete the item.

310-6.2 ASPHALT CEMENT. At the contract unit price per ton as full compensation for furnishing asphalt cement and for all delivery, placing, and incorporation of this material, and for all labor, equipment, tools, and incidentals necessary to complete the item. Removal of excess asphalt cement from the project area is subsidiary to the contract and no separate payment will be made.

310-6.3 PORTLAND CEMENT. At the contract unit price per ton as full compensation for furnishing portland cement and for all delivery, placing, and incorporation of this material, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-310a	Foamed Asphalt Stabilized Base Course - per square yard
Item P-310b	Asphalt Cement - per ton
Item P-310c	Portland Cement - per ton

TEST REQUIREMENTS

ATM 213	WAQTC FOP for AASHTO T 310 In-Place Density and Moisture Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)*
ATM 304	WAQTC FOP for AASHTO T 27/T 11 Sieve Analysis of Fine and Coarse Aggregates *
ATM 412	Relative Standard Density of Treated Mixes by the Control Strip Method
AASHTO T 26	Quality of Water to be Used in Concrete

MATERIAL REQUIREMENTS

ASTM C150	Portland Cement
AASHTO M 320	Performance-Graded Asphalt Binder