SPECIFICATIONS

FOR

EAST PERIMETER VEHICLE SERVICE ROAD REHABILITATION CONSTRUCTION

MEMPHIS INTERNATIONAL AIRPORT
MEMPHIS, TENNESSEE

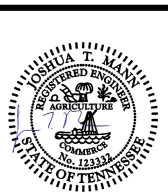
MSCAA PROJECT NO. 23-1476-10

DATED: 04/08/2025

ISSUED FOR BID

Memphis International Airport (MEM)
East Perimeter Vehicle Service Road Rehabilitation

TECHNICAL SPECIFICATIONS



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Tennessee.

JOSH MANN, PE
License Number: 123332

Pages or sheets covered by this seal:
All pages

Item A-101 TDOT Specification Reference

DESCRIPTION

101-1.1 GENERAL

A. All references to TDOT specifications shall be from the most current accepted Tennessee Department of Transportation (TDOT) Standard Specifications for Road and Bridge Construction.

B. TDOT specifications are included in these contract documents via reference. All materials, equipment, hauling, testing, and specifications shall be considered indicdental to the following items. All incidentals shall be included in the measurement and payment of the following items:

1. Item TDOT-203.01 ROAD AND DRAINAGE EXCAVATION (UNCLASSIFIED)
Method of Measurement and Basis of Payment shall be per cubic yard complete and in place.

2. Item TDOT- 203.02 UNDERCUTTING
Method of Measurement and Basis of Payment shall be per cubic yard complete and in place. Undercutting shall not be performed without approval from the MSCAA project engineer.

3. Item TDOT-304.01 SELECT MATERIAL (SOIL CEMENT BASE 8" THICK FOR FULL DEPTH REPAIR)
Method of Measurement and Basis of Payment shall be per square yard complete and in place at the depth specified. Select material shall not be disturbed without approval from the MSCAA project engineer.

4. Item TDOT-309.01 CEMENT TREATED BASE (8" THICK)
Method of Measurement and Basis of Payment shall be per square yard complete and in place at the depth specified.

5. Item TDOT-402.01 PRIME COAT
Method of Measurement and Basis of Payment shall be per gallon complete and in place.

6. Item TDOT-403.01 TACK COAT
Method of Measurement and Basis of Payment shall be per gallon complete and in place.

7. Item TDOT-407.01 HOT MIX ASPHALT (HMA) PAVEMENT - BASE COURSE (4.5" THICK) (TDOT 307 GRADING B-M PG 70-22)
Method of Measurement and Basis of Payment shall be per ton complete and in place.

8. Item TDOT-411.01 HOT MIX ASPHALT (HMA) PAVEMENT - SURFACE COURSE (2" THICK) (TDOT 411 GRADING D PG 70-22)
Method of Measurement and Basis of Payment shall be per ton complete and in place. Joint sealant and optional backer for asphalt-concrete joint locations shall meet TDOT standards and is considered incidental to this item.

9. Item TDOT 415.01 COLD PLANING BITUMINOUS PAVEMENT (2" THICK)
Method of Measurement and Basis of Payment shall be per square yard complete and in place.

10. RAISED PAVEMENT MARKER (TWO-SIDED REFLECTOR)
Method of Measurement and Basis of Payment shall be per each complete and in place.

END OF ITEM A-101

Item A-102 Construction Access, Project Safety and Security, and Traffic Control

DESCRIPTION

102-1.1 GENERAL

A. This project takes place within the Air Operations Area (AOA) of an active airfield; therefore, access to the site must be controlled by contractor provided gate guard or MSCAA approved personnel at all times. The access points are shown in the safety and phasing plans.

B. All vehicles accessing the project site on behalf of the Contractor shall enter through the security gates shown on the Plans.

C. The Contractor shall coordinate access and security within the AOA with the MSCAA Project Engineer.

D. The security gate shall remain closed and locked except when vehicles are entering or exiting.

E. Escort personnel, vehicles, and radio equipment shall be trained, badged and subject to approved by the MSCAA.

F. The Contractor shall insure that all AOA pavements, which are open to traffic, are continuously kept clean and free of debris of any kind. Vehicular haul roads shall also be kept clean. All costs shall be considered incidental to the Project.

G. Contractor must immediately remove any debris from active airfield and haul route pavements that results from construction activity.

H. The Contractor shall review and make themselves familiar with the Construction Safety and Phasing Plan (CSPP) and shall follow the requirements contained within. The CSPP is incorporated in the contract documents and included as Attachment A.

I. The Contractor shall review and make themselves familiar with the latest version of AC 150/5370-2 Safety Compliance Document (SPCD) worksheet for airport projects and shall follow the requirements contained within. The Contractor shall fill out the SPCD and submit the document 14 days prior to the pre-construction conference. The notice-to-proceed cannot be issued without approval of the document. The Construction Project Daily Safety Inspection Checklist within must be filled out daily. The SPCD is incorporated in the contract documents and included as Attachment B.

102-1.2 GATE OPERATIONS. Security gates to the AOA shall be closed and locked at all times that there is not a vehicle passing through them. Security gates will have one gate guard controlling the gate at all times. Use of multiple gates, such as during haul operations, requires the use of multiple gate guards. The Contractor shall be responsible for providing all required gate guards during construction activities. A formal gate guard procedure is in place and shall be adhered to by the Contractor at all times. A copy of that procedure and form is attached hereto.

102-1.3 SECURITY AND ESCORTS. The Contractor will provide badged personnel with non-movement area driving privileges and vehicles to escort Contractor, sub-contractor, vendor

and delivery vehicles and equipment from the security gate to the project site. All work shall be coordinated with MSCAA Project Engineer. A minimum of 48 hrs notice shall be provided to the MSCAA Project Engineer for site access.

Contractor's vehicles, including Sub-Contractors vehicles must be inspected and receive an airfield access sticker. This will allow these vehicles unrestricted access only on the Project site. Vendors and delivery vehicles (dump trucks, concrete trucks, and materials deliveries) must be escorted to their specific area on the site. Once at the project site, the Contractor shall be responsible to provide badged personnel to assume control of the escorted vehicle and non-badged personnel. Such vehicles may not transit back to the gate without an escort.

The Contractor shall meet all MSCAA security requirements with regard to training and wearing badges, and/or being escorted by authorized personnel approved by the MSCAA Project Engineer.

102-1.4 FENCING. The Contractor shall maintain the existing AOA security fencing and gates until the completion of the Project.

102-1.5 AIRFIELD LOW PROFILE BARRICADE. The Contractor shall install airfield low profile barricades to delineate the Contractor's work area and to control traffic and site access. Refer to the safety and phasing plans for additional information. Barricades shall be in accordance with the latest version of FAA AC 150/5370-2. The locations shown on the plans are approximate; the final location of the barricades shall be as determined in the field by the MSCAA Project Engineer and Contractor to fit the needs of the site. Relocation of barricades necessary to accommodate construction activities shall be considered incidental to the price of the barricades and no additional payment will be made. All barricades shall be removed prior to the completion of the project.

No part of the barricade or light shall exceed a height of eighteen (18) inches above the paved surface. The solar light shall be flashing red omni-directional and have at least five (5) candelas effective intensity for night marking. The barricades shall be painted with alternate orange and white diagonal striping. All barricades shall have lights flashing omni-directional red.

The Contractor shall be responsible to provide, install, maintain (including replacing batteries), relocate and remove the airfield low profile barricades as required or directed by the MSCAA Project Engineer during each phase of the project and shall repair or replace any barricade and/or light damaged by the Contractor, or others, during the Project.

The Contractor will be responsible for monitoring barricade placement and function during the duration of the project. If barricades move or are displaced due to weather or other means, the Contractor shall immediately notify the MSCAA Project Engineer prior to leaving the project work area to retrieve the barricade.

102-1.6 AIRFIELD MEDIUM PROFILE BARRICADE. The Contractor shall install airfield medium profile barricades delineate the Contractor's work area and to control traffic and site access. Refer to the safety and phasing plans for additional information. Barricades shall be in accordance with the latest version of FAA AC 150/5370-2. The locations shown on the plans are approximate; the final location of the barricades shall be as determined in the field by the MSCAA Project Engineer and Contractor to fit the needs of the site. Relocation of barricades necessary to accommodate construction activities shall be considered incidental to the price of the barricades and no additional payment will be made. All barricades shall be removed prior to the completion of the project.

No part of the barricade or light shall exceed a height of eighteen (32) inches above the paved surface. The solar light shall be flashing red omni-directional and have at least five (5) candelas effective intensity

for night marking. The barricades shall be painted with alternate orange and white diagonal striping. All barricades shall have lights flashing omni-directional red.

The Contractor shall be responsible to provide, install, maintain (including replacing batteries), relocate and remove the airfield low profile barricades as required or directed by the MSCAA Project Engineer during each phase of the project and shall repair or replace any barricade and/or light damaged by the Contractor, or others, during the Project.

The Contractor will be responsible for monitoring barricade placement and function during the duration of the project. If barricades move or are displaced due to weather or other means, the Contractor shall immediately notify the MSCAA Project Engineer prior to leaving the project work area to retrieve the barricade.

102-1.7 MAINTENANCE OF TRAFFIC. The Contractor shall maintain public roadways in a clean swept condition at all times. Any debris deposited on the public roads by the Contractor, Sub-Contractors or supplier vehicles shall be removed immediately. A water truck, broom truck, vacuum truck or other equipment as approved by the MSCAA Project Engineer shall be made available for this purpose. All costs associated with maintaining clean public roadways shall be considered incidental to the project.

The Contractor shall install signs and traffic control devices meeting the requirements of the Manual of Uniform Traffic Control Devices, TDOT Standards and FAA Publications about construction on Airports when and whereas directed by the MSCAA Project Engineer or the TDOT.

The Contractor shall furnish and install all construction warning signs, barricades, flexible drum channelizing units, temporary pavement markings, and other traffic control devices as shown on the plans or directed by the Project Engineer

102-1.8 ACCESS ROAD AND STAGING AREA. The Contractor shall repair and/or re- construct the access road and the staging area to repair any damage during construction. Repair methods shall be approved by the MSCAA Project Engineer prior to completion. All disturbed grass, topsoil, and other materials shall be restored to original condition prior to the completion of the project, in accordance with specifications T-904 and T-905.

102-1.9 PAVEMENT MARKING APPLICATION. The Contractor shall construct temporary and permanent pavement markings in accordance with the following:

a. Temporary Pavement Markings shall be applied 24 hours after sealant and/or surface course installation. Phase barricades and traffic control items shall not be relocated until markings are properly cured and dry. Temporary pavement markings shall constructed, measured, and paid in accordance with specification P-620.

b. Permanent Pavement Markings shall be applied 30 days after sealant and/or surface course installation. Phase barricades and traffic control items shall not be relocated until markings are properly cured and dry. Permanent pavement markings shall constructed, measured, and paid in accordance with specification P-620.

102-1.10 SAFETY PLAN COMPLIANCE DOCUMENT. The Safety Plan Compliance Document (SPCD) shall include all items related to the preparation of the SPCD.

METHOD OF MEASUREMENT

The following items to be measured shall include but not be limited to all labor, equipment, materials, supervision, and incidentals necessary to complete the work described within the CSPP.

102-2.1 CONSTRUCTION ACCESS, PROJECT SECURITY, AND STAGING AREA. This item shall be measured as percentage completion described under the basis of payment section.

102-2.2 MAINTENANCE OF TRAFFIC. This item shall be measured as percentage completion described under the basis of payment section.

102-2.3 AIRFIELD LOW PROFILE BARRICADE. The airfield low profile barricades shall not be measured as a separate quantity item, rather it shall be included as an incidental item with Construction Access, Project Security, and Staging Area.

102-2.4 AIRFIELD MEDIUM PROFILE BARRICADE. The airfield medium profile barricades shall not be measured as a separate quantity item, rather it shall be included as an incidental item with Construction Access, Project Security, and Staging Area.

BASIS OF PAYMENT

102-3.1 CONSTRUCTION ACCESS, PROJECT SECURTIY, AND STAGING AREA. Basis of payment shall be made at the contract lump sum price for Construction Access and Traffic Control. The price shall be full compensation for staffing gates including inspection of vehicles, escorting vehicles onto the site, badging, vehicle stickers & inspection, labor, materials, tools, and incidentals necessary to complete this item.

102-3.2 MAINTENANCE OF TRAFFIC. Basis of payment shall be made at the contract lump sum price for Maintenance of Traffic. The price shall be full compensation for providing all equipment, labor, and materials, and incidentals necessary to complete this item.

Payment will be made under:

Item A-102-3.1 Construction Access, Project Security, and Staging Area – per lump sum

Item A-102-3.2 Maintenance of Traffic – per lump sum

Based upon the contract lump sum price for the items above, the partial payments will be allowed as follows:

a. With first pay request, 25%.
b. When 25% or more of the original contract is earned, an additional 25%.
c. When 50% or more of the original contract is earned, an additional 40%.
d. After Final Inspection, Staging area clean-up and delivery of all Project Closeout materials, the final 10%.

END OF ITEM A-102

Item C-102 Temporary Air and Water Pollution, Soil Erosion, and Siltation Control

DESCRIPTION

102-1. This item shall consist of temporary control measures as shown on the plans or as ordered by the Resident Project Representative (RPR) during the life of a contract to control pollution of air and water, soil erosion, and siltation through the use of silt fences, berms, dikes, dams, sediment basins, fiber mats, gravel, mulches, grasses, slope drains, and other erosion control devices or methods.

Temporary erosion control shall be in accordance with the approved erosion control plan; the approved Construction Safety and Phasing Plan (CSPP) and AC 150/5370-2, *Operational Safety on Airports During Construction*. The temporary erosion control measures contained herein shall be coordinated with the permanent erosion control measures specified as part of this contract to the extent practical to assure economical, effective, and continuous erosion control throughout the construction period.

Temporary control may include work outside the construction limits such as borrow pit operations, equipment and material storage sites, waste areas, and temporary plant sites.

Temporary control measures shall be designed, installed and maintained to minimize the creation of wildlife attractants that have the potential to attract hazardous wildlife on or near public-use airports.

MATERIALS

102-2.1 Grass. Grass that will not compete with the grasses sown later for permanent cover per Item T-901shall be a quick-growing species (such as ryegrass, Italian ryegrass, or cereal grasses) suitable to the area providing a temporary cover. Selected grass species shall not create a wildlife attractant.

102-2.2 Mulches. Mulches may be hay, straw, fiber mats, netting, bark, wood chips, or other suitable material reasonably clean and free of noxious weeds and deleterious materials per Item T-908. Mulches shall not create a wildlife attractant.

102-2.3 Fertilizer. Fertilizer shall be a standard commercial grade and shall conform to all federal and state regulations and to the standards of the Association of Official Agricultural Chemists.

102-2.4 Slope drains. Slope drains may be constructed of pipe, fiber mats, rubble, concrete, asphalt, or other materials that will adequately control erosion.

102-2.5 Silt fence. Silt fence shall consist of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life. Silt fence shall meet the requirements of ASTM D6461.

102-2.6 Other. All other materials shall meet commercial grade standards and shall be approved by the RPR before being incorporated into the project.

CONSTRUCTION REQUIREMENTS

102-3.1 General. In the event of conflict between these requirements and pollution control laws, rules, or regulations of other federal, state, or local agencies, the more restrictive laws, rules, or regulations shall apply.

The RPR shall be responsible for assuring compliance to the extent that construction practices, construction operations, and construction work are involved.

102-3.2 Schedule. Prior to the start of construction, the Contractor shall submit schedules in accordance with the approved Construction Safety and Phasing Plan (CSPP) and the plans for accomplishment of temporary and permanent erosion control work for clearing and grubbing; grading; construction; paving; and structures at watercourses. The Contractor shall also submit a proposed method of erosion and dust control on haul roads and borrow pits and a plan for disposal of waste materials. Work shall not be started until the erosion control schedules and methods of operation for the applicable construction have been accepted by the RPR.

102-3.3 Construction details. The Contractor will be required to incorporate all permanent erosion control features into the project at the earliest practicable time as outlined in the plans and approved CSPP. Except where future construction operations will damage slopes, the Contractor shall perform the permanent seeding and mulching and other specified slope protection work in stages, as soon as substantial areas of exposed slopes can be made available. Temporary erosion and pollution control measures will be used to correct conditions that develop during construction that were not foreseen during the design stage; that are needed prior to installation of permanent control features; or that are needed temporarily to control erosion that develops during normal construction practices, but are not associated with permanent control features on the project.

Where erosion may be a problem, schedule and perform clearing and grubbing operations so that grading operations and permanent erosion control features can follow immediately if project conditions permit. Temporary erosion control measures are required if permanent measures cannot immediately follow grading operations. The RPR shall limit the area of clearing and grubbing, excavation, borrow, and embankment operations in progress, commensurate with the Contractor’s capability and progress in keeping the finish grading, mulching, seeding, and other such permanent control measures current with the accepted schedule. If seasonal limitations make such coordination unrealistic, temporary erosion control measures shall be taken immediately to the extent feasible and justified as directed by the RPR.

The Contractor shall provide immediate permanent or temporary pollution control measures to minimize contamination of adjacent streams or other watercourses, lakes, ponds, or other areas of water impoundment as directed by the RPR. If temporary erosion and pollution control measures are required due to the Contractor’s negligence, carelessness, or failure to install permanent controls as a part of the work as scheduled or directed by the RPR, the work shall be performed by the Contractor and the cost shall be incidental to this item.

The RPR may increase or decrease the area of erodible earth material that can be exposed at any time based on an analysis of project conditions.

The erosion control features installed by the Contractor shall be maintained by the Contractor during the construction period.

Provide temporary structures whenever construction equipment must cross watercourses at frequent intervals. Pollutants such as fuels, lubricants, bitumen, raw sewage, wash water from concrete mixing operations, and other harmful materials shall not be discharged into any waterways, impoundments or into natural or manmade channels.

All erosion control devices shall be monitored and cleaned out prior to the end of each work day or after each storm event as required or as directed by Project Engineer.

102-3.4 Installation, maintenance and removal of silt fence. Silt fences shall extend a minimum of 16 inches (41 cm) and a maximum of 34 inches (86 cm) above the ground surface. Posts shall be set no more than 10 feet (3 m) on center. Filter fabric shall be cut from a continuous roll to the length required minimizing joints where possible. When joints are necessary, the fabric shall be spliced at a support post with a minimum 12-inch (300-mm) overlap and securely sealed. A trench shall be excavated approximately 4 inches (100 mm) deep by 4 inches (100 mm) wide on the upslope side of the silt fence. The trench shall be backfilled and the soil compacted over the silt fence fabric. The Contractor shall remove and dispose of silt that accumulates during construction and prior to establishment of permanent erosion control. The fence shall be maintained in good working condition until permanent erosion control is established. Silt fence shall be removed upon approval of the RPR.

METHOD OF MEASUREMENT

102-4.1 The quantity of TDOT Catch Basin Protection (Type D) to be paid for shall be measured per each item complete, in place, and approved by the RPR.

102-4.2 The quantity of TDOT Curb Inlet and Culvert Protection (Type 2) to be paid for shall be measured per each item complete, in place, and approved by the RPR.

Control work performed for protection of construction areas outside the construction limits, such as borrow and waste areas, haul roads, equipment and material storage sites, and temporary plant sites, will not be measured and paid for directly but shall be considered as a subsidiary obligation of the Contractor.

BASIS OF PAYMENT

The following items to be paid for shall include all labor, equipment, materials, supervision, and incidentals necessary to complete the work.

102-5.1 The quantity of TDOT Catch Basin Protection (Type D) shall be paid for per each item complete, in place and approved by RPR.

Payment will be made under:

Item C-102-5.1 TDOT Catch Basin Protection (Type D) – per each

Where other directed work falls within the specifications for a work item that has a contract price, the units of work shall be measured and paid for at the contract unit price bid for the various items.

Temporary control features not covered by contract items that are ordered by the RPR will be paid for in accordance with Section 90, paragraph 90-05 *Payment for Extra Work*.

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 150/5200-33 *Hazardous Wildlife Attractants on or Near Airports*

AC 150/5370-2 *Operational Safety on Airports During Construction*

ASTM International (ASTM)

ASTM D6461 *Standard Specification for Silt Fence Materials*

United States Department of Agriculture (USDA)

FAA/USDA Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM C-102

Item C-105 Mobilization

105-1 Description. This item of work shall consist of, but is not limited to, work and operations necessary for the movement of personnel, equipment, material and supplies to and from the project site for work on the project except as provided in the contract as separate pay items.

105-2 Mobilization limit. Mobilization shall be limited to 10 percent of the total project cost.

105-3 Posted notices. Prior to commencement of construction activities, the Contractor must post the following documents in a prominent and accessible place where they may be easily viewed by all employees of the prime Contractor and by all employees of subcontractors engaged by the prime Contractor: Equal Employment Opportunity (EEO) Poster "Equal Employment Opportunity is the Law" in accordance with the Office of Federal Contract Compliance Programs Executive Order 11246, as amended; Davis Bacon Wage Poster (WH 1321) - DOL "Notice to All Employees" Poster; and Applicable Davis-Bacon Wage Rate Determination. These notices must remain posted until final acceptance of the work by the Owner.

105-4 Engineer/RPR field office. An Engineer/RPR field office is not required.

METHOD OF MEASUREMENT

105-5 Basis of measurement and payment. Based upon the contract lump sum price for "Mobilization" partial payments will be allowed as follows:

a. With first pay request, 25%.

b. When 25% or more of the original contract is earned, an additional 25%.

c. When 50% or more of the original contract is earned, an additional 40%.

d. After Final Inspection, Staging area clean-up and delivery of all Project Closeout materials as required by Section 90, paragraph 90-11, Contractor Final Project Documentation, the final 10%.

BASIS OF PAYMENT

105-6 Payment will be made under:

Item C-105-6.1 Mobilization (Maximum 10% of Total Bid) – per Lump Sum

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.

Office of Federal Contract Compliance Programs (OFCCP)

Executive Order 11246, as amended

EEOC-P/E-1 – Equal Employment Opportunity is the Law Poster

United States Department of Labor, Wage and Hour Division (WHD)

WH 1321 – Employee Rights under the Davis-Bacon Act Poster

END OF ITEM C-105

Item P-605 Joint Sealants for Pavements

DESCRIPTION

605-1.1 This item shall consist of providing and installing a resilient and adhesive joint sealing material capable of effectively sealing joints in pavement; joints between different types of pavements; and cracks in existing pavement.

MATERIALS

605-2.1 Joint sealants. Joint sealant materials shall meet the requirements of D6690.

Each lot or batch of sealant shall be delivered to the jobsite in the manufacturer's original sealed container. Each container shall be marked with the manufacturer's name, batch or lot number, the safe heating temperature, and shall be accompanied by the manufacturer's certification stating that the sealant meets the requirements of this specification.

605-2.2 Backer rod. The material furnished shall be a compressible, non-shrinking, non-staining, non-absorbing material that is non-reactive with the joint sealant in accordance with ASTM D5249. The backer-rod material shall be 25% ± 5 % larger in diameter than the nominal width of the joint.

605-2.3 Bond breaking tapes. Provide a bond breaking tape or separating material that is a flexible, non-shrinkable, non-absorbing, non-staining, and non-reacting adhesive-backed tape. The material shall have a melting point at least 5°F (3°C) greater than the pouring temperature of the sealant being used when tested in accordance with ASTM D789. The bond breaker tape shall be approximately 1/8 inch (3 mm) wider than the nominal width of the joint and shall not bond to the joint sealant.

CONSTRUCTION METHODS

605-3.1 Time of application. Joints shall be sealed as soon after completion of the curing period as feasible and before the pavement is opened to traffic, including construction equipment. The pavement temperature shall be 50°F (10°C) and rising at the time of application of the poured joint sealing material. Do not apply sealant if moisture is observed in the joint.

605-3.2 Equipment. Machines, tools, and equipment used in the performance of the work required by this section shall be approved before the work is started and maintained in satisfactory condition at all times. Submit a list of proposed equipment to be used in performance of construction work including descriptive data, 14 days prior to use on the project.

a. Tractor-mounted routing tool. Tractor-mounted routing tool is not allowed.

b. Concrete saw. Provide a self-propelled power saw, with water-cooled diamond or abrasive saw blades, for cutting joints to the depths and widths specified.

c. Sandblasting equipment. Sandblasting is not allowed.

d. Waterblasting equipment. Waterblasting is not allowed.

e. Hand tools. Hand tools may be used, when approved, for removing defective sealant from a crack and repairing or cleaning the crack faces. Hand tools should be carefully evaluated for potential spalling effects prior to approval for use.

f. Hot-poured sealing equipment. The unit applicators used for heating and installing ASTM D6690 joint sealant materials shall be mobile and shall be equipped with a double-boiler, agitator-type kettle with an oil medium in the outer space for heat transfer; a direct-connected pressure-type extruding device with a nozzle shaped for inserting in the joint to be filled; positive temperature devices for controlling the temperature of the transfer oil and sealant; and a recording type thermometer for indicating the temperature of the sealant. The applicator unit shall be designed so that the sealant will circulate through the delivery hose and return to the inner kettle when not in use.

605-3.3 Preparation of joints and cracks for repair. Pavement joints and cracks for application of material in this specification must be dry, clean of all scale, dirt, dust, curing compound, and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method cleans the joint and does not damage the joint.

a. Sawing. All joints shall be sawed in accordance with specifications and plan details. Immediately after sawing the joint, the resulting slurry shall be completely removed from joint and adjacent area by flushing with a jet of water, and by use of other tools as necessary.

b. Sealing. Immediately before sealing, the joints shall be thoroughly cleaned of all remaining laitance, curing compound, filler, protrusions of hardened concrete, old sealant and other foreign material from the sides and upper edges of the joint space to be sealed. After final cleaning and immediately prior to sealing, blow out the joints with compressed air and leave them completely free of debris and water. The joint faces shall be surface dry when the seal is applied.

c. Backer Rod. When the joint opening is of a greater depth than indicated for the sealant depth, plug or seal off the lower portion of the joint opening using a backer rod in accordance with paragraph 605-2.2 to prevent the entrance of the sealant below the specified depth. Take care to ensure that the backer rod is placed at the specified depth and is not stretched or twisted during installation.

d. Bond-breaking tape. Where inserts or filler materials contain bitumen, or the depth of the joint opening does not allow for the use of a backup material, insert a bond-separating tape breaker in accordance with paragraph 605-2.3 to prevent incompatibility with the filler materials and three-sided adhesion of the sealant. Securely bond the tape to the bottom of the joint opening so it will not float up into the new sealant.

605-3.4 Preparation of severe joints and cracks for repair. Upon completion of milling operations, RPR/Project Engineer shall determine the severity of the joint or crack to be repaired. Severe joints and cracks shall be repaired in accordance with the following requirements:

a. Sawing. Sawcut lines shall be parallel offset 3 inches to severe joint or crack centerline, and to a depth 1 inch minimum below the bottom of the joint or crack. Sawcut lines shall be laid out prior to sawing

b. Debris Removal. All material residing inside of the sawcut boundary shall be excavated to the extents of the severe joint or crack.

c. Inspection. Upon completion of the debris removal the RPR/Engineer shall inspect the condition of subbase material.

d. Repair. Severe joint or crack excavated locating shall be filled prior to paving operations with HMA TDOT 411-D.

605-3.5 Installation of sealants. Joints shall be inspected for proper width, depth, alignment, and preparation, and shall be approved by the RPR before sealing is allowed. Sealants shall be installed in accordance with the following requirements:

Immediately preceding, but not more than 50 feet ahead of the joint sealing operations, perform a final cleaning with compressed air. Fill the joints from the bottom up to 1/4 inch ± 1/8 inch below the top of pavement surface; or bottom of groove for grooved pavement. Remove and discard excess or spilled sealant from the pavement by approved methods. Install the sealant in such a manner as to prevent the formation of voids and entrapped air. In no case shall gravity methods or pouring pots be used to install the sealant material. Traffic shall not be permitted over newly sealed pavement until authorized by the RPR. When a primer is recommended by the manufacturer, apply it evenly to the joint faces in accordance with the manufacturer's instructions. Check the joints frequently to ensure that the newly installed sealant is cured to a tack-free condition within the time specified.

605-3.6 Inspection. The Contractor shall inspect the joint sealant for proper rate of cure and set, bonding to the joint walls, cohesive separation within the sealant, reversion to liquid, entrapped air and voids. Sealants exhibiting any of these deficiencies at any time prior to the final acceptance of the project shall be removed from the joint, wasted, and replaced as specified at no additional cost to the airport.

605-3.7 Clean-up. Upon completion of the project, remove all unused materials from the site and leave the pavement in a clean condition.

METHOD OF MEASUREMENT

605-4.1 The quantity of joint and crack repair to be paid for shall be measured by the number of linear feet of joint and crack repair in place, complete and accepted.

BASIS OF PAYMENT

605-5.1 Payment for joint and crack repair sealing material shall be made at the contract unit price per linear foot. The price shall be full compensation for furnishing all materials, for all preparation, delivering, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-605-5.1	Joint and crack repair – per linear foot
Item P-605-5.2	Severe joint and crack repair – per linear 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 D789	Standard Test Method for Determination of Relative Viscosity of Polyamide (PA)
ASTM D5249	Standard Specification for Backer Material for Use with Cold- and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints

ASTM D5893	Standard Specification for Cold Applied, Single Component, Chemically Curing Silicone Joint Sealant for Portland Cement Concrete Pavements
ASTM D6690	Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt
ASTM D7116	Standard Specification for Joint Sealants, Hot Applied, Jet Fuel Resistant Types for Portland Cement Concrete Pavements

Advisory Circulars (AC)

AC 150/5340-30	Design and Installation Details for Airport Visual Aids

END ITEM P-605

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 Resident Project Representative (RPR). 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 Resident Project Representative (RPR) prior to the initial application of markings. The reports can be used for material acceptance or the RPR may perform verification testing. The reports shall not be interpreted as a basis for payment. The Contractor shall notify the RPR 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 RPR.

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**
I or II	White	37925	115 ft^2/gal	I, Gradation A	7 lb/gal
I or II	Yellow	33538 or 33655	115 ft^2/gal	I, Gradation A	7 lb/gal
I or II	Red	31136	115 ft^2/gal	I, Gradation A	7 lb/gal
I or II	Black	37038	115 ft^2/gal	No Beads	No Beads
I or II	Temporary White	37925	230 ft^2/gal	No Beads	No Beads
I or II	Temporary Yellow	33538 or 33655	230 ft^2/gal	No Beads	No Beads
I or II	Temporary Red	31136	230 ft^2/gal	No Beads	No Beads
I or II	Temporary Black	37038	230 ft^2/gal	No Beads	No Beads

[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. Paint shall meet the requirements of Federal Specification TT-P-1952F, Type I or 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 and pink 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 and green paint.

Type III glass beads shall not be used in red and pink 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 RPR. 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 RPR 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 RPR 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 RPR. 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 RPR 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. 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 RPR.

The edges of the markings shall not vary from a straight line more than 1/2 inch (12 mm) in 50 feet (15 m), and marking dimensions and spacing shall be within the following tolerances:

Marking Dimensions and Spacing Tolerance

Dimension and Spacing	Tolerance
36 inch (910 mm) or less	±1/2 inch (12 mm)
greater than 36 inch to 6 feet (910 mm to 1.85 m)	±1 inch (25 mm)
greater than 6 feet to 60 feet (1.85 m to 18.3 m)	±2 inch (50 mm)
greater than 60 feet (18.3 m)	±3 inch (76 mm)

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 at the locations shown on the plans to 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.

Specification A-102 shall be referenced for time-frames between surface course placement and temporary and permanent marking applications.

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 RPR. 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 RPR. The Contractor shall dispose of these wastes in strict compliance with all applicable state, local, and federal environmental statutes and regulations.

METHOD OF MEASUREMENT

620-4.1 The quantity of temporary markings to be paid for shall be measured by the number of linear feet of marking complete and in place**.** Where markings are specified to be dashed lines, measurement shall be the end-to-end measurement of the total length of markings including skips and dashes. Where markings are specified to be double lines, measurement shall be the end to end measurement of total length of markings with no separate measurement for the second line.

620-4.2 The quantity of permanent markings to be paid for shall be measured by the number of linear feet of marking complete and in place**.** Where markings are specified to be dashed lines, measurement shall be the end-to-end measurement of the total length of markings including skips and dashes. Where markings are specified to be double lines, measurement shall be the end to end measurement of total length of markings with no separate measurement for the second line.

620-4.3 The quantity of surface painted stop signs and surface painted stop bars to be paid for shall be measured per each marking complete and in place.

620-4.4 The quantity of Movement/Non-movement marking to be paid for shall be measured by the number of square foot of marking complete and in place.

BASIS OF PAYMENT

The following items to be paid for shall include all labor, equipment, materials, supervision, and incidentals necessary to complete the work.

620-5.1 The quantity of temporary markings shall be paid for by the number of linear feet of marking complete and in place**.**

620-5.2 The quantity of permanent markings shall be paid for by the number of linear feet of marking complete and in place

620-5.3 The quantity of surface painted stop signs and surface painted stop bars shall be paid per each marking complete and in place.

620-5.4 The quantity of Movement/Non-movement marking shall be paid per square foot of marking complete and in place.

Payment will be made under:

Item P-620-5.1a	Temporary Pavement Marking – 6” Double Solid Yellow Line – per linear foot.
Item P-620-5.1b	Temporary Pavement Marking – 6” Single Solid White Line – per linear foot.
Item P-620-5.1c	Temporary Pavement Marking – 6” Single Dashed White Line – per linear foot.
Item P-620-5.2a	Permanent Pavement Marking – 6” Double Solid Yellow Line – per linear foot.
Item P-620-5.2b	Permanent Pavement Marking – 6” Single Solid White Line – per linear foot.
Item P-620-5.2c	Permanent Pavement Marking – 6” Single Dashed White Line – per linear foot.
Item P-620-5.3a	Permanent Pavement Marking – Stop Bar White – per each.
Item P-620-5.3b	Permanent Pavement Marking – Stop Bar Red (Red with White Outline and Lettering) – per each.
Item P-620-5.4	Permanent Pavement Marking – Movement/Non-movement (Yellow with Black Outline) – per 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

Item T-904 Sodding

DESCRIPTION

904-1.1 This item shall consist of furnishing, hauling, and placing approved live sod on prepared areas in accordance with this specification at the locations shown on the plans or as directed by the RPR.

MATERIALS

904-2.1 Sod. Sod furnished by the Contractor shall have a good cover of living or growing grass. This shall be interpreted to include grass that is seasonally dormant during the cold or dry seasons and capable of renewing growth after the dormant period. All sod shall be obtained from areas where the soil is reasonably fertile and contains a high percentage of loamy topsoil. Sod shall be cut or stripped from living, thickly matted turf relatively free of weeds or other undesirable foreign plants, large stones, roots, or other materials that might be detrimental to the development of the sod or to future maintenance. At least 70% of the plants in the cut sod shall be composed of the species stated in the special provisions, and any vegetation more than 6 inches (150 mm) in height shall be mowed to a height of 3 inches (75 mm) or less before sod is lifted. Sod, including the soil containing the roots and the plant growth showing above, shall be cut uniformly to a thickness not less than that stated in the special provisions.

904-2.2 Lime. Not required.

904-2.3 Fertilizer. Not required.

904-2.4 Water. The water shall be sufficiently free from oil, acid, alkali, salt, or other harmful materials that would inhibit the growth of grass.

904-2.5 Soil for repairs. The soil for fill and topsoiling of areas to be repaired shall be at least of equal quality to that which exists in areas adjacent to the area to be repaired. The soil shall be relatively free from large stones, roots, stumps, or other materials that will interfere with subsequent sowing of seed, compacting, and establishing turf, and shall be approved by the RPR before being placed.

CONSTRUCTION METHODS

904-3.1 General. Areas to be solid, strip, or spot sodded shall be shown on the plans. Areas requiring special ground surface preparation such as tilling and those areas in a satisfactory condition that are to remain undisturbed shall also be shown on the plans.

Suitable equipment necessary for proper preparation of the ground surface and for the handling and placing of all required materials shall be on hand, in good condition, and shall be approved by the RPR before the various operations are started. The Contractor shall demonstrate to the RPR before starting the various operations that the application of required materials will be made at the specified rates.

904-3.2 Preparing the ground surface. After grading of areas has been completed and before applying fertilizer and limestone, areas to be sodded shall be raked or otherwise cleared of stones larger than 2 inches (50 mm) in any diameter, sticks, stumps, and other debris which might interfere with sodding, growth of grasses, or subsequent maintenance of grass-covered areas. If any damage by erosion or other causes occurs after grading of areas and before beginning the application of fertilizer and ground limestone, the Contractor shall repair such damage. This may include filling gullies, smoothing irregularities, and repairing other incidental damage.

904-3.3 Applying fertilizer and ground limestone. Following ground surface preparation, fertilizer shall be uniformly spread at a rate which will provide not less than the minimum quantity of each fertilizer ingredient, as stated in the special provisions. If use of ground limestone is required, it shall then be spread at a rate that will provide not less than the minimum quantity stated in the special provisions. These materials shall be incorporated into the soil to a depth of not less than 2 inches (50 mm) by discing, raking, or other suitable methods. Any stones larger than 2 inches (50 mm) in any diameter, large clods, roots, and other litter brought to the surface by this operation shall be removed.

904-3.4 Obtaining and delivering sod. After inspection and approval of the source of sod by the RPR, the sod shall be cut with approved sod cutters to such a thickness that after it has been transported and placed on the prepared bed, but before it has been compacted, it shall have a uniform thickness of not less than 2 inches (50 mm). Sod sections or strips shall be cut in uniform widths, not less than 10 inches (250 mm), and in lengths of not less than 18 inches (0.5 m), but of such length as may be readily lifted without breaking, tearing, or loss of soil. Where strips are required, the sod must be rolled without damage with the grass folded inside. The Contractor may be required to mow high grass before cutting sod.

The sod shall be transplanted within 24 hours from the time it is stripped, unless circumstances beyond the Contractor's control make storing necessary. In such cases, sod shall be stacked, kept moist, and protected from exposure to the air and sun and shall be kept from freezing. Sod shall be cut and moved only when the soil moisture conditions are such that favorable results can be expected. Where the soil is too dry, approval to cut sod may be granted only after it has been watered sufficiently to moisten the soil to the depth the sod is to be cut.

904-3.5 Laying sod. Sodding shall be performed only during the seasons when satisfactory results can be expected. Frozen sod shall not be used and sod shall not be placed upon frozen soil. Sod may be transplanted during periods of drought with the approval of the RPR, provided the sod bed is watered to moisten the soil to a depth of at least 4 inches (100 mm) immediately prior to laying the sod.

The sod shall be moist and shall be placed on a moist earth bed. Pitch forks shall not be used to handle sod, and dumping from vehicles shall not be permitted. The sod shall be carefully placed by hand, edge to edge and with staggered joints, in rows at right angles to the slopes, commencing at the base of the area to be sodded and working upward. The sod shall immediately be pressed firmly into contact with the sod bed by tamping or rolling with approved equipment to provide a true and even surface, and ensure knitting without displacement of the sod or deformation of the surfaces of sodded areas. Where the sod may be displaced during sodding operations, the workmen, when replacing it, shall work from ladders or treaded planks to prevent further displacement. Screened soil of good quality shall be used to fill all cracks between sods. The quantity of the fill soil shall not cause smothering of the grass. Where the grades are such that the flow of water will be from paved surfaces across sodded areas, the surface of the soil in the sod after compaction shall be set approximately one inch (25 mm) below the pavement edge.

Where the flow will be over the sodded areas and onto the paved surfaces around manholes and inlets, the surface of the soil in the sod after compaction shall be placed flush with pavement edges.

On slopes steeper than one (1) vertical to 2-1/2 horizontal and in v-shaped or flat-bottom ditches or gutters, the sod shall be pegged with wooden pegs not less than 12 inches (300 mm) in length and have a cross-sectional area of not less than 3/4 sq inch (18 sq mm). The pegs shall be driven flush with the surface of the sod.

904-3.6 Watering. Adequate water and watering equipment must be on hand before sodding begins, and sod shall be kept moist until it has become established and its continued growth assured. In all cases, watering shall be done in a manner that will avoid erosion from the application of excessive quantities and will avoid damage to the finished surface.

904-3.7 Establishing turf. The Contractor shall provide general care for the sodded areas as soon as the sod has been laid and shall continue until final inspection and acceptance of the work. All sodded areas shall be protected against traffic or other use by warning signs or barricades approved by the RPR. The Contractor shall mow the sodded areas with approved mowing equipment, depending upon climatic and growth conditions and the needs for mowing specific areas. Weeds or other undesirable vegetation shall be mowed and the clippings raked and removed from the area.

904-3.8 Repairing. When the surface has become gullied or otherwise damaged during the period covered by this contract, the affected areas shall be repaired to re-establish the grade and the condition of the soil, as directed by the RPR, and shall then be sodded as specified in paragraph 904-3.5.

METHOD OF MEASUREMENT

904-4.1 This item shall not be measured for separate payment but considered incidental to specification A-102.

BASIS OF PAYMENT

904-5.1 This item will not be paid for separately but should be considered incidental to specification A-102.

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 C602 Standard Specification for Agricultural Liming Materials

Advisory Circulars (AC)

AC 150/5200-33 Hazardous Wildlife Attractants on or Near Airports

FAA/United States Department of Agriculture

Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM T-904

Item T-905 Topsoil

DESCRIPTION

905-1.1 This item shall consist of preparing the ground surface for topsoil application, removing topsoil from designated stockpiles or areas to be stripped on the site or from approved sources off the site, and placing and spreading the topsoil on prepared areas in accordance with this specification at the locations shown on the plans or as directed by the RPR.

MATERIALS

905-2.1 Topsoil. Topsoil shall be the surface layer of soil with no admixture of refuse or any material toxic to plant growth, and it shall be reasonably free from subsoil and stumps, roots, brush, stones (2 inches (50 mm) or more in diameter), and clay lumps or similar objects. Brush and other vegetation that will not be incorporated with the soil during handling operations shall be cut and removed. Ordinary sod and herbaceous growth such as grass and weeds are not to be removed, but shall be thoroughly broken up and intermixed with the soil during handling operations. Heavy sod or other cover, which cannot be incorporated into the topsoil by discing or other means, shall be removed. The topsoil or soil mixture, unless otherwise specified or approved, shall have a pH range of approximately 5.5 pH to 7.6 pH, when tested in accordance with the methods of testing of the Association of Official Agricultural Chemists in effect on the date of invitation of bids. The organic content shall be not less than 3% nor more than 20% as determined by the wet-combustion method (chromic acid reduction). There shall be not less than 20% nor more than 80% of the material passing the 200 mesh (75 μm) sieve as determined by the wash test in accordance with ASTM C117.

Natural topsoil may be amended by the Contractor with approved materials and methods to meet the above specifications.

905-2.2 Inspection and tests. Within 10 days following acceptance of the bid, the RPR shall be notified of the source of topsoil to be furnished by the Contractor. The topsoil shall be inspected to determine if the selected soil meets the requirements specified and to determine the depth to which stripping will be permitted. At this time, the Contractor may be required to take representative soil samples from several locations within the area under consideration and to the proposed stripping depths, for testing purposes as specified in paragraph 905-2.1.

CONSTRUCTION METHODS

905-3.1 General. Areas to be topsoiled shall be shown on the plans. If topsoil is available on the site, the location of the stockpiles or areas to be stripped of topsoil and the stripping depths shall be shown on the plans.

Suitable equipment necessary for proper preparation and treatment of the ground surface, stripping of topsoil, and for the handling and placing of all required materials shall be on hand, in good condition, and approved by the RPR before the various operations are started.

905-3.2 Preparing the ground surface. Immediately prior to dumping and spreading the topsoil on any area, the surface shall be loosened by discs or spike-tooth harrows, or by other means approved by the

RPR, to a minimum depth of 2 inches (50 mm) to facilitate bonding of the topsoil to the covered subgrade soil. The surface of the area to be topsoiled shall be cleared of all stones larger than 2 inches (50 mm) in any diameter and all litter or other material which may be detrimental to proper bonding, the rise of capillary moisture, or the proper growth of the desired planting. Limited areas, as shown on the plans, which are too compact to respond to these operations shall receive special scarification.

Grades on the area to be topsoiled, which have been established by others as shown on the plans, shall be maintained in a true and even condition. Where grades have not been established, the areas shall be smooth-graded and the surface left at the prescribed grades in an even and compacted condition to prevent the formation of low places or pockets where water will stand.

905-3.3 Obtaining topsoil. Prior to the stripping of topsoil from designated areas, any vegetation, briars, stumps and large roots, rubbish or stones found on such areas, which may interfere with subsequent operations, shall be removed using methods approved by the RPR. Heavy sod or other cover, which cannot be incorporated into the topsoil by discing or other means shall be removed.

When suitable topsoil is available on the site, the Contractor shall remove this material from the designated areas and to the depth as directed by the RPR. The topsoil shall be spread on areas already tilled and smooth-graded, or stockpiled in areas approved by the RPR. Any topsoil stockpiled by the Contractor shall be rehandled and placed without additional compensation. Any topsoil that has been stockpiled on the site by others, and is required for topsoil purposes, shall be removed and placed by the Contractor. The sites of all stockpiles and areas adjacent thereto which have been disturbed by the Contractor shall be graded if required and put into a condition acceptable for seeding.

When suitable topsoil is secured off the airport site, the Contractor shall locate and obtain the supply, subject to the approval of the RPR. The Contractor shall notify the RPR sufficiently in advance of operations in order that necessary measurements and tests can be made. The Contractor shall remove the topsoil from approved areas and to the depth as directed. The topsoil shall be hauled to the site of the work and placed for spreading, or spread as required. Any topsoil hauled to the site of the work and stockpiled shall be rehandled and placed without additional compensation.

905-3.4 Placing topsoil. The topsoil shall be evenly spread on the prepared areas to a uniform depth of 2 inches (50 mm) after compaction, unless otherwise shown on the plans or stated in the special provisions. Spreading shall not be done when the ground or topsoil is frozen, excessively wet, or otherwise in a condition detrimental to the work. Spreading shall be carried on so that turfing operations can proceed with a minimum of soil preparation or tilling.

After spreading, any large, stiff clods and hard lumps shall be broken with a pulverizer or by other effective means, and all stones or rocks (2 inches (50 mm) or more in diameter), roots, litter, or any foreign matter shall be raked up and disposed of by the Contractor. after spreading is completed, the topsoil shall be satisfactorily compacted by rolling with a cultipacker or by other means approved by the RPR. The compacted topsoil surface shall conform to the required lines, grades, and cross-sections. Any topsoil or other dirt falling upon pavements as a result of hauling or handling of topsoil shall be promptly removed.

METHOD OF MEASUREMENT

905-4.1 Topsoil shall not be measured as a separate quantity item, rather it shall be included as incidental to other items

BASIS OF PAYMENT

905-5.1 Payment will be made at the contract unit price per cubic yard (cubic meter) for topsoil (obtained on the site). This price shall be full compensation for furnishing all materials and for all preparation, placing, and spreading of the materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item T-905-5.1	No separate payment for topsoil.

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 C117	Materials Finer than 75 μm (No. 200) Sieve in Mineral Aggregates by Washing

Advisory Circulars (AC)

AC 150/5200-33	Hazardous Wildlife Attractants on or Near Airports

FAA/United States Department of Agriculture

Wildlife Hazard Management at Airports, A Manual for Airport Personnel

END OF ITEM T-905

ATTACHMENT 1

CONSTRUCTION SAFETY AND PHASING PLAN (CSPP)

MSCAA Project No.: 23-1476-10
Foth Infrastructure and Environment, LLC Project No.: 0024M300.10

East Perimeter Vehicle Service Road Rehabilitation

April 07, 2025

FINAL

Prepared for:
Memphis-Shelby County Airport Authority (MSCAA)
Memphis International Airport
Memphis, Tennessee

Prepared by:
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2121 Innovation Court, Suite 500
De Pere, WI 54115

Purpose

Careful planning, scheduling, and coordination of construction activities can minimize disruption of normal aircraft operations and avoid situations that compromise the airport's operational safety. The CSPP is the culmination of that planning effort during the design of the project. MSCAA staff, the FAA, and critical stakeholders have provided input on this CSPP. It has been developed from guidance set forth in the FAA Advisory Circular 150/5370-2G, Operations Safety on Airports During Construction. It is imperative that the provisions set forth in this plan be reviewed by the Contractor prior to mobilizing to the site and the document be followed without alteration.

Prior to mobilization, the Contractor must submit a Safety Plan Compliance Document (SPCD) describing how the Contractor will comply with the requirements set forth in this CSPP. An example SPCD is provided as an appendix to this document.

If the Contractor sees a need to alter the CSPP in any way, a request must be submitted to MSCAA, in writing, prior to the start of construction. Please note that changes to the CSPP may require coordination with all impacted parties and, potentially, a resubmittal to the FAA. This can be a 90–120 day process. If the change is accepted, it will be treated the same as any other change to the contract documents.

If the Contractor's activities do not comply with the provisions of this CSPP, the Contractor will be issued a written request to immediately cease the non-compliant action until a meeting can be held to discuss the issues and all necessary corrective actions, to be performed by the Contractor, are in place. Delays for non-compliance with the CSPP will not result in an extension of the allotted contract time for any phase of work or the total contract. All liquidated damage provisions set forth in the contract will still apply.

Scope of Work

The primary goal for this project is to rehabilitate pavement on the vehicle service road (VSR) that runs around the east end of RWY 9/27. This road is heavily utilized by baggage tugs, push-back tractors and other aviation support vehicles and equipment45. The primary scopes of work will be cold milling of surface asphalt, full pavement depth repair in spot locations, and hot mix asphalt paving. Also included will be replacement of roadway markings, shaping and grading of turfed shoulders, and erosion prevention and sedimentation control.

Coordination

Airport operational safety during construction will be discussed at the pre-design, pre-bid, and pre-construction conferences. Construction progress meetings and meetings with the FAA Air Traffic Organization (ATO) will be coordinated as required throughout the contract.

The Contractor must provide contact information for key construction personnel prior to the start of the project. MSCAA will add engineering staff and key airport personnel to this list and it will be distributed to all relevant parties. Updated and current contact lists must be submitted if personnel change.

1. Prebid Conference

A pre-bid conference will be held for prospective bidders to ask questions and visit the site.

2. Preconstruction Conference

A pre-construction conference will be held prior to issuance of Notice to Proceed. Attendees will include MSCAA Engineering Staff, MSCAA Operations Staff, local air traffic control management (if necessary), MSCAA Maintenance Staff, Engineer of Record, Engineer Field Staff (RPR), Contractor Project

Superintendent, and Contractor Foreman, as well as the project foreman for each subcontractor employed by the prime Contractor. The agenda for this preconstruction conference will include a review of this CSPP.

3. Construction Progress Meetings

Construction progress meetings will be held throughout the duration of the project. Attendees will include MSCAA Engineering Staff, MSCAA Operations Staff, Prime Contractor, Project Superintendent and/or Foreman, and Engineer of Record and/or Engineer Field Staff (RPR). Local air traffic control management as well as airport tenants will be invited as needed, based on the project work impacting their operations on a week-to-week basis. Construction phasing and safety will be a standing agenda item at the weekly construction progress meetings.

4. Daily Coordination

At all times when construction activities are being performed on this project, the prime Contractor must have a foreman on-site who is authorized to make decisions regarding the operations and safety of all personnel employed by the Contractor and Subcontractors. The designated foreman will meet with Airport Operations Staff as work items being performed require.

5. ATCT Coordination

Coordination with ATCT will be as needed during the project. Only properly badged personnel with Class 3 driving privileges, Engineer Field Staff (RPR), or MSCAA will contact the ATCT during the project. The MEM Ground frequency is 121.9 MHz and MEM UNICOM frequency is 122.95 MHz.

6. CSPP Modifications

Proposed changes and substantial delays will require additional coordination with the airport and the FAA for the purpose of evaluating possible revisions to the CSPP. FAA shall approve of all proposed CSPP changes prior to execution.

Phasing

1. Locations, Durations, and Sequence of the Work

All work for each phase shall be completed in accordance with the project phasing plans, the project technical specifications, this CSPP, and the Contractor submitted SPCD.

The project has a duration of 45 calendar days and consists of one primary work area. A calendar day is defined as any day on the calendar. It includes Saturdays, Sundays, Holidays, and non-workdays. Refer to the project plans for graphical depictions of the phases along with notes on phase-specific sequencing and operational requirements. In general, the phases are as follows:

a. Phase 1

   Phase 1 work has a duration of 10 calendar days and has no sub-phases. Phase 1 consists of work done in the inside lanes of the VSR. Traffic will be maintained on the outside lanes during this phase.

b. Phase 2

Phase 2 work has a duration of 10 calendar days and has no subphases. Phase 2 consists of work done in the outside lanes of the VSR. Traffic will be maintained on the inside lanes during this phase.

c. Phase 3

Phase 3 has a work duration of 10 calendar days and has no subphases. Phase 3 consists of work done at the tie-in locations on both ends of the VSR. Traffic will be maintained around construction activities during this phase.

d. Phase 4

Phase 4 has a work duration of 2 calendar days and has no subphases. Phase 4 consists exclusively of placing the permanent markings along the VSR. Work will be done at all locations within the project footprint. Traffic will be maintained around construction activities during this phase.

Affected Areas of Operations

1. Operational Affect Table

Operational Requirement	Normal	Phase 1	Phase 2	Phase 3	Phase 4
Runway 18R/36L	9,320’ length ADG D-V	Open	Open	Open	Open
Runway 18C/36C	11,120’ length ADG D-V	Open	Open	Open	Open
Runway 18L/36R	9000’ length	Open	Open	Open	Open
Runway 9/27	9000’ length	Open	Open	Open	Open
All other Taxiways	Varies	Open	Open	Open	Open

Navigational Aid (NAVAID) Facilities

Aircraft Navigational Aids provide visual and electronic information that is used by pilots who operate and land aircraft at the airport. Construction activities can have negative impacts on the functionality and serviceability of NAVAIDS.

There are no anticipated impacts to NAVAIDS associated with this project.

Contractor Access

1. Stockpiled Materials/Staging Location

Stockpiled materials and equipment storage are not permitted within active Safety Areas (RSA/TSA), Object Free Zones (OFZ), and Object Free Areas (OFA) of an operational runway or taxiway. Staging and stockpile location(s) are shown in the plans and may be located within the AOA.

There is one staging area for this project: Located within project limits.

Stockpiles are limited to maintain a clear line of sight from the Air Traffic Control Tower to all active taxiways and runways. Stockpile locations shall not be located over any MSCAA or FAA electrical/communications infrastructure.

a. Height

Stockpile height limits for material will be 20 feet.

b. Wildlife Attractant

The Contractor must manage stockpiles so that they do not attract wildlife (Refer to Wildlife Management Section below).

c. Foreign Object Debris (FOD)

The Contractor must manage stockpiles so that they do not create FOD (Refer to Foreign Object Debris (FOD) Management section below).

2. Vehicle and Personnel Operations

a. Access to Airport Operations Area (AOA)

The airport operations area is defined by the perimeter fence surrounding the airfield. Access onto the AOA is through any number of gates along the fence or doors through buildings. Contractor access onto the AOA is limited to Gate FX-WN-1.

No person shall enter upon the Air Operations Area (AOA) or any other restricted area except Contractors that have been authorized and have completed security badge training and have been assigned to duty therein, or personnel escorted by an appropriately badged escort.

b. Mechanisms to Prevent Improper Movement

Contractor operations within the AOA are limited to the areas shown on the project phasing plans. A visual boundary will be installed by the Contractor around the work area. The boundary will consist of lighted low-profile barricades on pavement surfaces (when closed) at the perimeter of the work area and/or orange traffic cones, generally aligning with Object Free Area limits of adjacent operational pavement. Additionally, the boundary will consist of high-visibility orange safety fence on turfed surfaces, installed as shown on detail in project plans. The project phasing plans show the location of the work area boundary. Construction vehicles and personnel shall not cross barricades without an approved escort.

c. Parking Areas for Personal Vehicles and Equipment

Contractor employee personal vehicles shall be parked outside of the AOA. Employee parking shall be as shown on the plans. Contractor employee personal vehicles shall not be driven inside

the AOA. Contractor vehicles and equipment are allowed inside of the project work area within the AOA. Equipment staging/parking areas are shown on the project phasing plans and must be approved in advance by the MSCAA.

d. Haul Routes

The phasing plan sheets depict haul routes from adjacent public roadways to the individual phase work areas through the airport perimeter fence. Contractor access and hauling operations are strictly limited to the haul route shown. Prior to the start of construction, the Contractor, Engineer and Owner will review haul routes and document existing condition. Following completion of construction, the Contractor, Engineer, and Owner will review haul routes and document condition. The Contractor is required to restore haul routes to original condition.

e. Contractor Vehicle Marking and Lighting

Each Contractor licensed vehicle must display a company logo on both sides of sufficient size to be recognizable to personnel in the control tower. Signs must be a minimum of 200 square inches and be approved by the airport. Specialized construction equipment does not require signs. Each Contractor licensed vehicle must have a yellow/amber rotating beacon affixed to the uppermost part of the vehicle. Lights must be visible from any direction, including the air. Construction equipment does not require rotating beacon lights during day operations, provided an aircraft warning flag is displayed at the highest point of the equipment. Contractor vehicle marking and lighting is the sole responsibility of the Contractor. The airport will not provide markings, flags, or lights.

3. Radio Communications

a. Two-Way Radios

Contractors may utilize two-way radios on the project provided that they do not interfere with existing Airport and FAA communication equipment and frequencies.

b. Air Traffic Control (ATC) Radio Communication

For this project, when the Contractor requires access to the movement area, staff with Class 3 driving privileges or the Engineer Field Staff (RPR) will communicate with ATCT.

4. Airport Security

a. The Memphis-Shelby County Airport Authority (MSCAA) conducts its security operations in a serious manner and incorporates its mandated security directives to the letter. The management of the Airport fully expects all Tenants and Contractors to help enforce security regulations. The MSCAA strictly enforces the requirements on issuance and use of Airport identification/access media. Companies and individuals found to be in non-compliance with rules and regulations outlined in this manual may face revocation of access privileges and/or prosecution. The Contractor shall comply with all security requirements as outlined in the contract documents.

b. The Contractor shall provide security at entry points, staging/storage locations, employee parking areas, and the work areas.

5. TSA Requirements

The Transportation Security Administration (TSA) through several Transportation Security Regulations (TSR) has the regulatory power to assess fines for breaches of airport security. The TSA will test the Contractors security means and methods for compliance with applicable security codes and regulations throughout the course of the project. Accordingly, if the Contractor is found culpable for security breaches, fines assessed to the Airport will be collected from the Contractor.

6. Security Badging Requirements

The Contractor will be required to obtain security badging in accordance with the requirements in the Specification.

7. Contractor Access

The Contractor shall be responsible for controlled access to the work site. The Contractor shall provide and manage security/badged personnel at proposed access locations.

Wildlife Management

1. Trash

Food scraps must be collected from construction personnel activity continuously.

2. Standing Water

Any activity taking place that creates a standing body of water must be remedied within 24 hours.

3. Tall Grass and Seeds

If needed within the project area, the contractor shall be responsible for mowing the grass within their work areas. Mowing schedules have been established to maintain, when possible, a height of 6 to 10 inches to help prevent large flocks of starlings, crows, and other species from becoming a hazard. It will be the responsibility of the Contractor to establish and maintain a schedule that allows a maximum grass height of 10 inches within the construction work area.

4. Poorly Maintained Fencing and Gates

Periodic perimeter fence inspections are required by the Contractor to ensure the fence is secured. Fence inspections performed by the contractor shall be within the vicinity of the project area, staging area, and site access points. Any issues shall be reported to MSCAA Operations or the MSCAA Project Engineer. These inspections also include identifying any animal digs that are located under the fence and ensuring that perimeter gates and drainage grates are tightly secured to prevent animal access. In addition, Contractors will take appropriate actions to reduce any other observed wildlife activity.

5. Disruption of Existing Wildlife Habitat

While this will frequently be unavoidable due to the nature of the project, Contractor personnel should immediately notify airport operations of a wildlife sighting.

Foreign Object Debris (FOD) Management

1. Description of FOD

Foreign object debris at airports includes any object found in an inappropriate location that can damage aircraft, equipment, or airport personnel. On construction sites, FOD typically is comprised of loose gravel, blowing sand, dust, wire bristles from sweeper heads, food wrappers, and material packaging. The presence of FOD on an airport's air operations area (AOA) poses a significant threat to the safety of air travel. FOD has the potential to damage aircrafts during critical phases of flight, which can lead to catastrophic loss of life and airframe, and at the very least increased maintenance and operating costs.

2. Methods of FOD Control

a. Training

The Contractor shall provide training to all employees working within the AOA on effective FOD management. Training shall include description and consequences of FOD, FOD awareness, and housekeeping procedures.

b. Housekeeping

Preventing FOD from occurring is the most effective form of FOD management. The Contractor must monitor construction activities and proactively develop a plan to prevent FOD from occurring. Typical FOD prevention measures include the use of covered trash containers, covered loads, zero tolerance of littering, and tying down items which may be easily wind-blown.

c. Ground Vehicle Tire Inspections

Prior to entering active airfield pavement, the Contractor must perform a vehicle tire check for any loose rocks that may be in the tread. Tires covered in mud must be cleaned prior to entering active airfield pavement in order to prevent tracking of dirt.

d. Pavement Inspections

Prior to opening completed portions of pavement work to airport operations, the Contractor shall keep the entire pavement surface clean and to the satisfaction of the Owner. Work areas will be inspected and approved by the MSCAA prior to opening the area to aircraft operations. This includes conducting a FOD walk with the RPR and MSCAA operations staff prior to opening.

e. FOD Inspections

Refer to Inspection Requirements section for FOD inspection requirements. The Contractor shall keep the project site and vehicles clean, employing a "clean as you go" approach throughout the project.

Hazardous Material Management

1. Haz-Mat Procedures

Haz-Mat Procedures are to be developed by the Contractor and submitted to the Engineer for review and Owner's records, including but not limited to:

a. Fuel Storage Locations

b. Spill Procedures

c. MSDS

All temporary fuel storage tanks brought to the site must be double walled and placed in secondary containment. In addition, the tanks must be permitted by the fire marshal prior to use.

Notification of Construction Activities

1. List of Responsible Representatives

Persons who have questions concerning policies, procedures, or requirements of the Airport Security Program, should contact Airport Administration. Persons who observe a security violation, suspicious act, or any serious act that may endanger persons or property should immediately contact Airport Public Safety.

a.	Emergency	(901) 922-8333
b.	MSCAA Emergencies	(901) 922-8333
c.	MSCAA Operations Center	(901) 922-8117
d.	MSCAA Communication Center	(901) 922-8298
e.	NAVAID Emergency Contract	1-866-432-2622

2. NOTAMs

Contractor shall coordinate with the Engineer Field Staff (RPR) and Airport Operations personnel for the issuance of all NOTAMs related to the project construction. Airport Operations and FAA shall generate and issue NOTAMs based on Contractor construction schedules and facility impacts.

3. Emergency Notification Procedures

In the case of a life-threatening situation, dial 911 and Airport Public Safety immediately thereafter. Airport Public Safety will coordinate any emergency response.

4. Aircraft Emergencies

In the event of an aircraft emergency, the Engineer Field Staff (RPR) will coordinate with Aircraft Rescue and Fire Fighting (ARFF) and the FAA and all construction personnel shall stop work and wait for direction from Airport Public Safety. In the event evacuation is requested, personnel shall immediately vacate the work site, secure construction access gate(s), and return when cleared by Airport Public Safety.

5. Coordination with ARFF Personnel

The Contractor must coordinate, through the RPR, with ARFF personnel, mutual aid providers, and other emergency services if construction requires the following:

a. The deactivation and subsequent reactivation of water lines or fire hydrants.

b. The re-routing or blocking of emergency access routes.

c. The use of hazardous materials on the airfield.

Inspection Requirements

1. FOD Inspection

During construction, the Contractor shall continuously monitor for FOD and remove immediately.

2. Contractor Inspection

a. Prior to opening completed work areas and pavement to aircraft operations, the contractor shall coordinate with Airport Operations for inspection of the work area. Pavements must be free of all dirt, sand, gravel, wire bristles, or any other objects that could cause damage to aircraft engines. All soil areas must be free of dirt clods, ruts, or surface irregularities that could damage an aircraft should it leave the pavement.

b. Daily inspections shall be completed to assure all traffic control devices are in proper locations and working order.

3. Airport Operations Inspection

The MSCAA staff will conduct pavement inspections prior to opening any pavement to aircraft operations.

4. Final Inspections

Before re-opening closed sections of the airport to operations, the Contractor, Airport Operator, and Engineer Field Staff (RPR) shall inspect the area. Upon their concurrence that the area is safe to operate aircraft, the area will re-open.

Underground Utilities

Special attention shall be given to preventing unscheduled interruption of utility services and facilities. It is the Contractor's responsibility to locate all existing utilities and underground airport facilities that may be affected by this project and to verify their exact location and elevation prior to commencing work.

Electrical cables, telecommunication lines, overhead electrical lines, FAA communication lines, jet fuel lines, sanitary sewer lines, storm water lines, gas lines, and water lines may be located in the limits or vicinity of work limits. Utilities interfering with construction shall be reset or relocated by the Contractor or utility company concerned, unless noted otherwise. The Contractor shall give proper notice to all utility companies and facility owners regarding removal/relocation or when working in the vicinity of utility lines and airport facilities.

The Contractor shall call Tennessee 811 and submit a completed MSCAA On Airport Utility Locate Request form to the Engineer Field Staff (RPR) 72 hours prior to digging on site. The Contractor will verify with all parties the location of all utilities before digging begins. Prior to digging near a utility, the contractor shall pothole the utility to physically verify its location and depth. The Contractor shall use extreme care in digging around the utility so as not to cause any damage to the utility. All subcontractors performing excavation activities shall follow the same procedures as outlined above.

Penalties

The following penalties will be administered by the Airport, FAA, and Transportation Security Administration (TSA) as allowed per the requirements of the Construction Safety and Phasing Plan.

1. Escort Violation and Piggybacking, Wearing of Security Badge, Challenging Penalties

The following penalties apply for all persons: who do not properly display their security badge on the upper body (waist level or above) on the outermost garment; who do not challenge another person in their area who is not properly displaying their security badge; who allow another person to piggyback on their card through an entry; or who allow unauthorized access to the SIDA through an entry. It is necessary for each employee entering the SIDA/AOA to enter their PIN along with having their badge read by the appropriate device.

a. 1st Offense Penalty—Airport badge for each employee involved will be suspended for a minimum of seven (7) days, at the discretion of the Airport Security Coordinator (ASC) depending on the severity of the security infraction. The employee must attend MSCAA security training.

b. 2nd Offense Penalty—Airport badge for each employee involved will be suspended for a minimum of thirty (30) days, at the discretion of the ASC depending on the severity of the infraction. The employee(s) and their supervisors(s) must attend security training.

c. 3rd Offense Penalty—Airport badge for each employee will be suspended for one (1) year. The employee(s) and their supervisors(s) must attend security training. Reinstatement is at the sole discretion of the MSCAA ASC.

2. Runway Incursions

A runway incursion is any unauthorized intrusion onto a runway, regardless of whether or not an aircraft presents a potential conflict. See runway incursion penalty table below:

Runway Incursion Category	Description	Penalty
Category A	A serious incident in which a collision was narrowly avoided.	$1500 and Rescission of Access to the AOA
Category B	An incident in which separation decreases and there is a significant potential for collision, which may result in a time critical corrective/evasive response to avoid a collision.	$500 and Rescission of Access to the AOA
Category C	An incident characterized by ample time and/or distance to avoid a collision.	Rescission of Driving Privileges
Category D	An incident that meets the definition of runway incursion such as incorrect presence of a single vehicle/person/aircraft on the protected area of a surface designated for the landing and take-off of aircraft but with no immediate safety consequences.	Written Warning

Violations of the CSPP outside of runway incursions will be assessed a written warning for the first violation and then $500 per violation thereafter.

3. Returning Airport Badge

All security badges issued by the MSCAA Identification Office are the property of the Memphis-Shelby County Airport Authority and must be returned upon expiration, separation of employment (for any

reason), when job function no longer requires an airport-issued security badge, and/or upon demand from the MSCAA. Retainage will not be related until all badges have been returned at the end of the project. Any misuse or willful failure to return a security badge is punishable by criminal prosecution. Security badges are non-transferable and must be used only by the person to whom they are issued. The security badge must be returned to the Company manager/supervisor at the end of employment and, in turn, by the Company to the MSCAA Identification Office.

4. Driver—Restricted Areas

All restricted area (SIDA/AOA) drivers shall possess and carry a valid US driver's license while driving on MSCAA restricted area roadways. Each driver is required to receive behind the wheel driver's training on the SIDA/AOA by their Employer and must take and successfully pass the written examination administered by the MSCAA at the security training class.

5. Releasing Airport Security Information

No person issued a security badge may divulge any information concerning an act of unlawful interference with civil aviation if such information is likely to jeopardize the safety of domestic or international aviation, or regarding any airport or airport tenant's security system to unauthorized persons.

6. Lost, Stolen, or Misplaced Security Badges

Immediately report to the Airport Authority by all means available NO EXCEPTIONS. Report to the ID Office 901-922-8788; if outside normal business hours, report to the MSCAA Communication Center at 901-922-8298. You must speak with Airport Security Personnel to report the unaccounted-for Security Badge.

7. Authority and Legal Action

The airport public safety department and designated airport security coordinators can issue violations resulting from poor or improper driving or security procedures. It is also the responsibility of all badge holders to notify public safety immediately when a possible breach in security has occurred.

8. FOD

The airport has a zero-tolerance approach to FOD, and the Contractor may be subject to fines from the Airport, FAA, or other agencies for failure to properly manage FOD during construction activities.

Special Conditions

In the case of an aircraft in distress or an accident, all Contractor personnel must remove all equipment from the project site and return to the staging area. The project will be suspended until clearance is given from the Engineer Field Staff (RPR) and the Airport Operator. In the event of a V/PD, the project will be suspended until a safety meeting and de-briefing of the incident occurs. In the event of a declared severe weather event, including an event requiring low-visibility operations/surface movement guidance and control system (LVO/MGCS) procedures, airport operations personnel may request the Contractor to temporarily suspend operations and vacate the premise until the event is over.

Runway and Taxiway Visual Aids—Marking, Lighting, Signs, and Visual Aids

Areas where aircraft will be operating are clearly and visibly separated from construction areas. Throughout the duration of the construction project, verify that these areas remain clearly marked and visible at all times.

1. General

Airport markings, lighting, signs, and visual NAVAIDs must be clearly visible to pilots and not be misleading, confusing, or deceptive. All must be secured in-place to prevent movement by prop wash, jet blast, wing vortices, or other wind currents and constructed of materials that would minimize damage to an aircraft in the event of inadvertent contact.

2. Markings

Markings must be in compliance with the standards of AC 150/5340-1, Standards for Airport Markings. Runway and exit taxiways closed to aircraft operations are marked with a yellow X.

a. Temporary Closed Runways

For runways that have been temporarily closed, place an X at each end of the runway directly on or as near as practicable to the runway designation numbers.

b. Temporary Closed Taxiways

Place barricades outside the safety area of intersecting taxiways. For runway/taxiway intersections, place an X at the entrance to the closed taxiway from the runway.

c. Temporary Closure X

Construct the temporary closure X from any of the following materials: fabric, colored plastic, painted sheets of plywood, snow fence, or similar materials. They must be yellow and properly configured and appropriately secured to prevent movement by prop wash, jet blast, or other wind currents.

d. Temporary Markings

The application rate of paint to mark a short-term temporary runway and taxiway marking may deviate from the standard, but the dimensions must meet the existing standards.

3. Lighting and Visual NAVAIDs

Lighting must be in conformance with AC 150/5340-30, Design and Installation Details for Airport Visual Aids, and AC 150/5345-50, Specifications for Portable Runway and Taxiway Lights. When disconnecting runway and taxiway lighting fixtures, disconnect the associated isolation transformers. Alternatively, cover the light fixture in such a way as to prevent light leakage. Avoid removing the lamp from energized fixtures because an excessive number of isolation transformers with open secondaries may damage the regulators and/or increase the current above its normal value. Secure, identify, and place any aboveground temporary wiring in rigid conduit to prevent electrocution and fire ignition sources. Where possible, avoid allowing equipment and vehicles to drive over the conduit. If this cannot be avoided, the Contractor must protect the conduit from movement and damage with ramps that distribute the load away from the conduit. All temporary protection measures must be submitted to the Engineer Field Staff (RPR) prior to use.

4. Temporarily Closed Runways

If available, use a lighted X, both at night and during the day, placed at each end of the runway facing the approach. For runways that have been temporarily closed, but for an extended period, and for those with

pilot-controlled lighting, disconnect the lighting circuits or secure switches to prevent inadvertent activation.

5. Partially Closed Runways and Displaced Thresholds (not used)

6. Temporarily Closed Taxiways

If possible, deactivate the taxiway lighting circuits. When deactivation is not possible (for example, other taxiways on the same circuit are to remain open), cover the light fixture in such a way to prevent light leakage.

7. Temporary Signs

Orange construction signs comprise a message in black on an orange background. Orange construction signs may help pilots be aware of changed conditions. The airport operator may choose to introduce these signs as part of a movement area construction project to increase situational awareness when needed. Locate signs outside the taxiway safety limits and ahead of construction areas so pilots can take timely action. Use temporary signs judiciously, striking a balance between the need for information and the increase in pilot workload. When there is a concern of pilot "information overload," the applicability of mandatory hold signs must take precedence over orange construction signs recommended during construction. To the extent possible, signs must be in conformance with AC 150/5345-44, Specifications for Runway and Taxiway Signs and AC 150/5340-18, Standard for Airport Sign Systems. At any time, if a sign does not serve its normal function, it must be covered or removed to prevent misdirecting pilots.

Marking and Signs for Access Routes

Pavement markings and signs for construction personnel will conform to AC 150/5340-18 and, to the extent practicable, with the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD) and/or state highway specifications.

Hazard Marking, Lighting, and Signing

a. Low profile barricades with flashing red lights will be used at the perimeter of all pavement closures. Barricade spacing shall be as shown on the plans. Refer to the phasing plans for exact locations of low-profile barricades. Barricade placement and operation of flashing red lights shall be checked daily, at a minimum, for proper placement and operation and fixed immediately upon discovery of any deficiencies.

b. All construction vehicles shall have an amber rotating beacon and signage.

c. All construction equipment shall have an orange and white aircraft warning flag.

d. All tall construction equipment shall have a red obstruction light in addition to an orange and white aircraft warning flag.

e. The Contractor shall provide a representative on-call 24-hours a day for emergency maintenance of hazard marking, barricades, lighting and signage.

Work Zone Lighting

All work is anticipated to be constructed during daytime hours. If a need for night work arises, the Contractor must submit a work zone lighting plan to the RPR.

Protection of Runway and Taxiway Safety Areas

Runway Safety Areas (RSA), Taxiway Safety Areas (TSA), Obstacle Free Zones (OFZ), Object Free Areas (OFA), and approach surfaces must be protected during construction and are shown on the plan sheets. Protection of these areas includes limitations on the locations and height of equipment and stockpiled material. See the plan sheets of the CSPP for locations and dimensions of the protected areas.

1. Runway Safety Area (RSA) and Taxiway Safety Area (TSA)

A runway safety area is the defined surface surrounding the runway prepared or suitable for reducing the risk of damage to airplanes in the event of an undershoot, overshoot, or excursion from the runway. A taxiway safety area is a defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an airplane unintentionally departing the taxiway. Construction activities within the existing RSA and TSA are subject to the following conditions:

a. No construction may occur within the existing RSA or TSA while the corresponding runway or taxiway is open for aircraft operations.

b. Open trenches or excavations are not permitted within the RSA or TSA while the corresponding runway or taxiway is open. If possible, backfill trenches before the runway or taxiway is opened. If the runway or taxiway must be opened before the excavations are backfilled, cover the excavations appropriately. Covering for open trenches must allow safe operation of the heaviest aircraft operating on the runway or taxiway across the trench without damage to the aircraft. Construction Contractors must prominently mark open trenches and excavations at the site with red or orange flags, as approved by the airport operator, and light them with red lights during hours of restricted visibility or darkness.

c. Soil erosion must be controlled to maintain RSA and TSA standards. The RSA and TSA must be cleared and graded and have no potentially hazardous ruts, humps, depressions, or other surface variations, and capable, under dry conditions of supporting the occasional passage of aircraft without causing structural damage to the aircraft.

2. Runway Object Free Area (ROFA)

Construction, including excavations, may be permitted in the ROFA. However, equipment must be removed from the ROFA when not in use, and material should not be stockpiled in the ROFA if not necessary.

3. Taxiway Object Free Area (TOFA)

Unlike the Runway Object Free Area, aircraft wings regularly penetrate the taxiway object free area during normal operations. Thus, the restrictions are more stringent. Except as provided below, no construction may occur within the TOFA while the taxiway is open for aircraft operations.

a. Construction activity may be accomplished within the TOFA subject to the following restrictions:

    1. Appropriate NOTAMs are issued.

    2. Marking and lighting meeting the provisions of this CSPP are implemented.

    3. Five-foot clearance is maintained between equipment and materials and any part of an aircraft (includes wingtip overhang). In these situations, flaggers must be used to direct

construction equipment and wing walkers will be necessary to guide aircraft. Wing walkers should be airline/aviation personnel rather than construction workers.

4. Obstacle Free Zone (OFZ)

In general, personnel, material, and/or equipment may not penetrate the OFZ while the runway is open for aircraft operations. If a penetration to the OFZ is necessary, it may be possible to continue aircraft operations through operational restrictions.

5. Runway Approach/Departure Areas and Clearways

All personnel, materials, and/or equipment must remain clear of the applicable threshold siting surfaces as shown on the plan sheets of the CSPP. Objects that do not penetrate these surfaces may still be obstructions to air navigation.

Other Limitations on Construction

a. Tall equipment used by the Contractor requires airport approval and a 7460-1 determination letter issued by the FAA for such equipment.

b. All Contractor's construction equipment shall require an orange and white flag.

c. The use of open flame welding or torches is prohibited unless fire safety precautions are provided and airport operations has approved their use. A hot work permit must be obtained and the airport's Hot Work Program followed.

d. The use of electrical blasting caps is prohibited on or within 1,000 feet of airport property.

e. Construction suspension may be required during specific airport operations. The Airport Operator will notify the Contractor and Engineer if this is required.

f. Emergency Aircraft Rescue and Firefighting (ARFF) access in and around the site must be maintained by the Contractor at all times. Any hazards, open trenches, or excavations near the ARFF access must be clearly marked and lighted with red lights during hours of restricted visibility or darkness.

ATTACHMENT 2

ATTACHMENT B: AC 150/5370-2G SAFETY COMPLIANCE DOCUMENT (SPCD) WORKSHEET FOR AIRPORT PROJECTS

Contractor's Responsibility

Following Federal Aviation Administration Advisory Circular 150/5370-2G, this SPCD shall be submitted to the Engineer and to the airport operator for review and approval. This should be submitted 14 days prior to the preconstruction conference. The notice-to-proceed cannot be issued without approval of this document.

The SPCD shall be prepared in a detailed, written and pictorial format (if needed) that identifies the timing and methodology for the contractor's compliance with the project's Construction Safety and Phasing Plan (CSPP) located in the construction plans & specifications. Any analysis and determination can be made of the proposed modification.

Project Information

Project ID: _____ Airport: _____
Description of Project: _____
Type of Work: _____
Prime Contractor: _____
Address: _____
Contractor Contact: _____ Phone: _____
BOA Project Manager: _____ Phone: _____
Airport Operations Contact: _____ Phone: _____

The following shall be complement the safety plan compliance document:

1. Contractor shall have copies of the CSPP and SPCD available at all times for reference by the airport operator and its representatives, and by subcontractors and contractor employees.

   Location (s) of CSPP and SPCD:

   _____
   _____

2. Provide a point of contact who will coordinate an immediate response to correct any construction-related activity that may adversely affect the operational safety of the airport. Project will require a 24-hour coverage.

   Point of Contact: _____Phone: _____

3. Contractor's on-site employees responsible for monitoring compliance with the CSPP and SPCD whenever active construction is taking place.

   Contact Person: _____ Phone: _____

Contact Person: _____ Phone: _____

4. The contractor shall list all proposed deviations or modifications to the CSPP. For each alteration, the contractor shall provide:

    a. The reason why the alteration is desired
    b. Provide a sufficient narrative description and/or pictorial descriptions of the proposed change so a complete review of the proposal can be made.
    c. If no alterations are to be made to the CSPP, clearly state; **"No alterations to the CSPP are proposed."**

    The following are proposed deviations or modifications to the CSPP:

    _____
    _____
    _____

    (Attach additional sheets as needed)

5. The contractor shall provide a list of the specific hazard equipment and lighting that will be employed to ensure compliance.

    The following are proposed hazard equipment and lighting for the project:

    _____
    _____
    _____

    (Attach additional sheets as needed)

6. The contractor shall describe the frequency of inspections to ensure construction personnel comply with the CSPP and SPCD and that there are no altered construction activities that could create potential safety hazards. Inspections shall ensure that all proper safety devices, signs, demarcations etc. are in placer and in proper working order in accordance with the approved CSPP & SPCD. A Construction Project Daily Safety Checklist is attached to aid in making a thorough inspection.

    The inspection frequency will be _____.

7. Provide a description and schedule for any anticipated supplemental submittal through the airport operator of Form 7460-1 for the purpose of conducting aeronautical study of contractor, equipment such as tall equipment (cranes, concrete pumps, and other equipment), stock piles, and haul routes when difference from cases previously filed as part of the CSPP.

    An additional Form7460-1 will/will not (circle one) be required. If additional Form 7460-1 will be required, they will be submitted by _____.

8. Provide a description of the contractor's plan to ensure that the construction personnel are familiar with the safety procedures and regulations on the airport, the CSPP, and the SPCD.

_____

_____

_____

(Attach additional sheets as needed)

SPCD Amendment

The SPCD shall be amended anytime there is a construction practice proposed by the contractor that does not conform to the CSPP and SPCD and may impact the airport's operational safety. This will require a revision to the CSPP and SPCD and re-coordination with the airport operation and the FAA in advance.

Certification

I certify that we understand the operational safety requirements of the CSPP and assert that we will not deviate from the approved CSPP and SPCD unless written approval is granted by the airport operator.

Print Name: _____ Title: _____

Signature: _____ Date: _____

Note to Contractor: Please provide copies of your company's general safety policy as an attachment.

Appendix D. AC 150/5370-2G – December 13, 2017

Construction Project Daily Safety Inspection Checklist

The situations identified below are potentially hazardous conditions that may occur during airport construction projects. Safety area encroachments, unauthorized and improper ground vehicle operations, and unmarked or uncovered holes and trenches near aircraft operating surfaces pose the most prevalent threats to airport operational safety during airport construction projects. The list below is one tool that the airport operator or constrictor may use to aid in identifying and correcting potentially hazardous conditions. It should be customized as appropriated for each project.

Table D-1. Potentially Hazardous Conditions

Item	Action Required (Describe)	Or	None
Excavation adjacent to runways, taxiways, and apron improperly backfilled.			☐
Mounds of earth, construction materials, temporary structures, and other obstacle near any open runway, taxiway, or taxi lane; in the related Object Free area and aircraft approach or departure areas/zones; or obstructing any signs or marking.			☐
Runway resurfacing projects resulting in lips exceeding 3 in (7.6 cm) from pavement edges and ends.			☐
Heavy equipment (stationary or mobile) operating or idle near AOA, in runway approaches and departures areas, or in OFZ.			☐
Equipment or material near NAVAIDS that may degrade or impair radiated signals and/or the monitoring of navigation and visual aids. Unauthorized or improper vehicle operations in localizer or glide slope critical areas, resulting in electronic interference and/or facility shutdown.			☐
Tall and especially relatively low visibility units) that is, equipment			☐

with slim profiles) – cranes, drills, and similar objects – located in critical areas, such as OFZ and approach zones.		
Improperly positioned or malfunctioning lights or unlighted airport hazards, such as holes or excavations, or any, apron, open taxiway, or open taxi lane or in a related safety, approach, or departure area.		☐
Obstacles, loose pavement, trash and other debris on or near AOA. Construction debris (gravel, sand mud, and paving materials) on airport pavements may result in aircraft propeller, turbine engine, or tire damage. Also, loose materials may blow about, potentially causing personal injury or equipment damage.		☐
Inappropriate or poorly maintained fencing during construction intended to deter human and animal intrusions into the AOA. Fencing and other markings that are inadequate to separate constructions areas from open AOA create aviation hazards.		☐
Improper or inadequate marking or lighting of runways (especially thresholds that have been displaced or runways that have been closed) and taxiways that could cause pilot confusion and provide a potential for a runway incursion. Inadequate or improper methods of marking, barricading, and lighting of temporarily closed portions of AOA create aviation hazards.		☐
Wildlife attractants – such as trash (food scraps not collected from the construction personnel activity), grass seeds, tall grass, or standing water – or any near airports.		☐
Obliterated or faded temporary markings on active operational areas.		☐

Misleading or malfunctioning obstruction lights. Unlighted or unmarked obstructions in the approach to any open runway pose aviation hazards.		☐

Failure to issue, update, or cancel NOTAMs about airport or runway closures or other construction airport conditions.		☐
Failure to mark and identify utilities or power cables. Damage to utilities and power cables during construction activity can result in the loss of runway/taxiway lighting; loss of navigation, visual, or approach aids; disruption of weather reporting services and/or loss of communications.		☐
Restrictions on ARFF access from fire stations to the runway/taxiway system or airport buildings.		☐
Lack of radio communications with construction vehicles in airport movement areas.		☐
Objects, regardless of whether they are marked or flagged, or activities anywhere on or near an airport that could be distracting, confusing, or alarming to pilots during aircrafts operations.		☐
Water, snow, dirt, debris, or other contaminants that temporarily obscure or derogate the visibility of runway/taxiway marking, lighting, and pavement edges. Any condition or factor that		☐

obscures or diminishes the visibility of areas under construction.		
Spillage from vehicles (gasoline, diesel fuel, oil) on active pavement areas, such as runways, taxiways, aprons, and airport roadways.		☐

Failure to maintain drainage system integrity during construction (for example, no temporary drainage provided when working on a drainage system).		☐
Failure to provide for proper electrical lockout and tagging procedures. At larger airports with multiple maintenance shifts/works, construction contractors should make provisions for coordinating work on circuits.		☐
Failure to control dust. Consider limiting the amount of area from which contractor is allowed to strip turf.		☐
Exposed wiring that created an electrocution or fire ignition hazard. Identify and secure wiring, and place it in conduit or bury it.		☐
Site burning, which can cause possible obscuration.		☐
Construction work taking place outside of designated work areas and out of phase.		☐