Project Manual

Bangor International Airport

Base Bid:
Reconstruct Taxiway 'A' (2,081 ± LF x 75')
Rehabilitate Taxiway 'A' (1,056 ± LF x 75')

Additive Alternate #1:
Reconstruct Taxiway 'A' (3,643 ± LF x 75')
Rehabilitate Taxiway 'A' (383 ± LF x 75')

Additive Alternate #2:
Rehabilitate Taxiway 'M' (900 ± LF x 75')

Prepared for

BGR BANGOR INTERNATIONAL AIRPORT

CITY BID P26-40
AIP 3-23-0005-0XX-2026
Mead and Hunt, Inc. 4242100-251517.01

Prepared by

Mead & Hunt
www.meadhunt.com

March 6, 2026 – Issued for Bid

SPECIFICATIONS FOR

BASE BID

RECONSTRUCT TAXIWAY 'A' (2,081 ± LF X 75') AND REHABILITATE TAXIWAY 'A' (1,056 ± LF X 75')

ADDITIVE ALTERNATE #1

RECONSTRUCT TAXIWAY 'A' (3,643 ± LF X 75') AND REHABILITATE TAXIWAY 'A' (383 ± LF X 75')

ADDITIVE ALTERNATE #2

REHABILITATE TAXIWAY 'M' (900 ± LF X 75')

AT THE

BANGOR INTERNATIONAL AIRPORT

BANGOR, MAINE

I hereby certify that these specifications were prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Maine.

_____

Leigh Bartlett, P.E

Registration No. PE 11283

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Part 1

Advertisement and Bidders Instructions

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INVITATION FOR BIDS

The City of Bangor, Maine invites sealed bid proposals for furnishing all labor and materials and performing all work in connection with a construction contract at the Bangor International Airport, Bangor, Maine as follows:

BASE BID

RECONSTRUCT TAXIWAY 'A' (2,081 ± LF X 75') AND REHABILITATE TAXIWAY 'A' (1,056 ± LF X 75')

ADDITIVE ALTERNATE #1

RECONSTRUCT TAXIWAY 'A' (3,643 ± LF X 75') AND REHABILITATE TAXIWAY 'A' (383 ± LF X 75')

ADDITIVE ALTERNATE #2

REHABILITATE TAXIWAY 'M' (900 ± LF X 75')

FAA AIP NO. 3-23-0005-XXX-2026

Sealed bid proposals will be received until 2:00 P.M., prevailing time, Wednesday April 1, 2026, at the office of the CITY OF BANGOR, CUSTOMER SERVICE WINDOW, and at that time will be publicly opened and read, in the Paul Bunyan Room, 73 Harlow Street, Bangor, Maine 04401.

A MANDATORY PRE-BID CONFERENCE WILL BE HELD IN THE TERMINAL BUILDING OF THE BANGOR INTERNATIONAL AIRPORT, 3rd FLOOR, 287 GODFREY BOULEVARD, BANGOR MAINE AT 10:00 A.M., PREVAILING TIME, ON Thursday March 12, 2026. PROSPECTIVE BIDDERS ARE TO CHECK IN AT THE RECEPTION ON THE 1ST FLOOR TO ACCESS.

A site visit to view the work areas will be made available after the pre-bid conference. The Airport reserves the right to limit the number of people that can access the site at one time.

A certified check or bid bond in an amount not less than **5%** of the bid price for the Contract work will be required from each bidder. The bid security, made payable to the City of Bangor, shall be as described under **INSTRUCTION TO BIDDERS**.

The Instruction to Bidders, Bid Proposal, Contract Documents, Drawings, and Specifications may be examined at

1) Bangor International Airport, 287 Godfrey Boulevard, Bangor ME 04401
   Please contact Beth Martin (bmartin@flybangor.com) to schedule an appointment.

Documents for bidding may be obtained AFTER 12:00 P.M., Friday March 6, 2026, from City of Bangor. (www.bangormaine.gov/proposals) Digital files of the plans, specifications, and complete bid document in .pdf format are available for down load free-of-charge to prospective bidders via e-mail upon written request. Please e-mail: **bids@bangormaine.gov** to request a copy of the documents.

It is the bidder's responsibility to provide an e-mail address to the CITY OF BANGOR for use in

issuance of any addenda. The city encourages all potential bidders to register as a vendor at **www.bangormaine.gov/vendorregistration**.

It is expected that the Contractor will order all necessary equipment and materials associated with the project as soon as the contract has been executed to avoid delays when the "Notice to Proceed" is issued.

The proposed development to be accomplished under this contract will be subject to the requirements of the Buy American preference in accordance with 49 USC § 50101.

This project is subject to the Foreign Trade Restriction Clause in accordance with 49 CFR 30.

Attention of bidders is called to the requirements as to conditions of employment, the minimum wage rates to be paid under this contract and to procedures under the appropriate sections, as amended, of the laws of the State of Maine and the Federal Government including Davis-Bacon requirements as defined in 2 CFR § 200 Appendix II(D).

The bidder's attention is directed to the Debarment and Suspension laws of the State of Maine and the Federal Government in accordance with 2 CFR part 180 (Subpart C), 2 CFR part 1200, DOT Order 4200.5 DOT Suspension & Debarment Procedures & Ineligibility.

The bidder's attention is directed to Drug-free Workplace requirements as set forth in 49 CFR Part 32.

Notice of Requirement for Affirmative Action

The proposed development to be accomplished under this contract will be subject to the Federal Equal Employment Opportunity (EEO) requirements of 41 CFR Part 60, Executive Order 11246, and Title VI of the Civil Rights Act; the State of Maine EEO; and the Disadvantaged Business Enterprise Plan of the Federal Aviation Administration and the City of Bangor, Maine. This contract has a Total DBE participation goal of **0.0%.**

Title VI Solicitation Notice

The Bangor International Airport – City of Bangor Maine, in accordance with the provisions of Title VI of the Civil Rights Act of 1964 (78 Stat. 252, 42 U.S.C. §§ 2000d to 2000d-4) and the Regulations, hereby notifies all bidders that it will affirmatively ensure that any contract entered into pursuant to this advertisement, disadvantaged business enterprises will be afforded full and fair opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

Notice to Prospective Federally Assisted Construction Contractors – Non-segregated Facilities.

1. By submitting a bid/proposal under this solicitation, the bidder or offeror certifies that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The bidder or offeror agrees that a breach of this clause is a violation of the Equal Opportunity clause in this contract.
2. "Segregated facilities," as used in this clause, means any waiting rooms, work areas, rest rooms and washrooms, restaurants and other eating areas, time clocks, locker rooms and other storage dressing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, sex, or national origin because of written or oral policies or employee custom. The term does not include separate or single-user rest rooms or

necessary dressing or sleeping areas provided to assure privacy between the sexes.
3. The bidder or offeror shall include this clause in every subcontract and purchase order that is subject to the Equal Opportunity clause of this contract.

Assurance and/or Certification statements of the Bidder as provided in the bid documents must be executed (signed) and submitted at the time of the bid opening. These certifications are intended to satisfy the Federal Aviation Administration (FAA), Maine Department of Transportation, and County laws relative to the non-segregation, non-discrimination, and DBE practices.

The City of Bangor reserves the right to waive any informalities or to reject any or all bids, or to accept any other than the lowest bidder, should it be deemed to be in the best interest of the City to do so.

By submitting a bid/proposal under this solicitation, the bidder or offeror certifies that at the time the bidder or offeror submits its proposal that neither it nor its principals are presently debarred or suspended by any Federal department or agency from participation in this transaction.

After the actual date of the bid opening no bidder may withdraw his/her bid prior to October 31, 2026
This work generally consists of the following elements:

2026 CONSTRUCTION ACTIVITES/WORK:
MAJOR ITEMS OF WORK:

THIS PROJECT CONSISTS OF THE REHABILITATION AND RECONSTRUCTION OF TAXIWAY A IN DESIGNATED AREAS AND THE REHABILITATION OF THE ENTIRE TAXIWAY M. THE PROJECT WILL INCLUDE REMOVAL OF EXISTING ASPHALT CONCRETE (AC) VIA ASPHALT PAVEMENT MILLING, RUBBLIZATION OF EXISTING UNDERLYING PORTLAND CEMENT CONCRETE (PCC) SLABS, NEW PAVEMENT CONSTRUCTION WITH PAVED SHOULDER, MARKINGS, CLEANING OF STORM DRAIN INFRASTRUCTURE, UNDERDRAIN SYSTEM, GRADING AND EROSION AND SEDIMENT CONTROL, AND TAXIWAY EDGE LIGHTING.

Ken Kinnear
Purchasing Coordinator
City of Bangor, Maine

INSTRUCTIONS TO BIDDERS

Owner and Owner's Representative

The Owner as stated herein refers to the following agency: **City of Bangor.** The Owner's authorized representative as stated herein refers to the Owner's Consultant, **Mead & Hunt, Inc.**, herein referred to as Engineer.

Bidder Representations

By submittal of a proposal (bid), the BIDDER represents the following:

- The Bidder has read and thoroughly examined the project documents.
- The Bidder has a complete understanding of the terms and conditions required for the satisfactory performance of project work.
- The Bidder has fully informed themselves of the project site, the project site conditions and the surrounding area.
- The Bidder has familiarized themselves of the requirements of working on an operating airport and understands the site conditions that may in any manner affect cost, progress or performance of the work.
- The Bidder has correlated their observations with that of the project documents.
- The Bidder has found no errors, conflicts, ambiguities or omissions in the project documents, except as previously submitted in writing to the owner that would affect cost, progress or performance of the work.
- The Bidder is familiar with all applicable State and local laws, rules and regulations pertaining to execution of the contract and the project work.
- The Bidder has complied with all requirements of these instructions and the associated bid documents.

Bid Documents/Project Manual

The bid documents are comprised of the following; Advertisement for Bids, Instructions-to-Bidders, General Provisions, Special Provisions, Technical Specifications, Project Drawings, Proposal Form with attachments, Form of Contract Agreement, any authorized addenda issued by the Owner and any document incorporated in whole or in part by reference therein.

All documents comprising the Bid Documents are complementary to one another and together establish the complete terms, conditions and obligations of the successful bidder.

Those individual elements of the Contract Documents that are provided together shall also be referred to as the Project Manual.

Prospective bidders may obtain a copy of the project manual and project drawings from the designated office identified within the Notice-to-Bidders.

Modifications to Project Documents

Modifications to the project documents may only be made by written addendum issued by the Owner or the Engineer. Verbal explanations, interpretations or comments made by the Owner or Owner's representative shall not be binding. Addenda will be transmitted to all known official plan holders. Each bidder shall certify at the time of bid submittal that they acknowledge receipt of all issued addenda.

Errors and Discrepancies in Project Documents

Should Bidder find an error, discrepancy, ambiguity or omission in the project documents prior to submittal of a proposal, the Bidder is obligated to contact the Owner or Engineer with written notice of the error, discrepancy, ambiguity or omission. The written notice shall identify the nature and location of the error, discrepancy, ambiguity, or omission. Corrections or modifications to the project documents will only be made

by written addendum as prescribed herein. By submittal of a Bid Proposal, Bidder represents that they have thoroughly reviewed the project documents and that they have not identified any error, discrepancy, ambiguity or omission that would affect cost, progress or performance of the project work.

Clarifications and Interpretations
A bidder requiring a clarification or interpretation of the project documents shall make a written request to the Engineer at the following email address **bids@bangormaine.gov**
Any requests, to be given consideration, must be received at no later than the Close of Business (4:00 pm EST) March 20, 2026.

Interpretations of Estimated Proposal Quantities
An estimate of quantities of work to be accomplished and materials to be furnished under these specifications is stated within the project manual. This estimate is a result of careful calculations and is believed to be correct. The estimated quantities are given only as a basis for comparison of proposals and the award of contract. The Owner does not expressly or impliedly agree that the actual quantities involved will correspond exactly with the estimated quantities.

The Bidder shall not plead misunderstandings or deception because of such estimates of quantities, or of the character, location, or other conditions pertaining to the work. Payment to the Contractor will be made only for the actual quantities of work performed or materials furnished in accordance with the plans and specifications. It is understood that the quantities may be increased or decreased as hereinafter provided in the subsection titled “Alteration of Work and Quantities” of the general provisions without in any way invalidating the unit bid prices.

Examination of Plans, Specifications and Site Conditions
As stated within the “Bidder Representations” and reaffirmed herein, the Bidder is expected to carefully examine the site of the proposed work, the proposal, drawings, specifications, terms and conditions of the proposed agreement and the form of agreement. The Bidder shall satisfy themselves as to the character, quality, and quantities of work to be performed, materials to be furnished and as to the requirements of the proposed contract. The submission of a proposal shall be prima facie evidence that the Bidder has made such examination and is satisfied as to the conditions to be encountered in performing the work and as to the requirements of the proposed contract, plans and specifications.

Issuance of Proposal Forms
The Owner reserves the right to refuse to issue a proposal form to a prospective bidder should the bidder be in default for any of the following reasons:

- Failure to pay, or satisfactory settle, all bills due for labor and materials on former contracts in force (with the owner) at the time the owner issues the proposal to a prospective bidder.
- Contractor default under previous contracts with the owner
- Unsatisfactory work on previous contracts with the owner

Form of Proposal
All bid proposals shall be made on the forms provided by the Owner within the provided Project Manual. No bidder may submit more than one proposal. All proposals are to be written in ink and shall be clearly legible. All blank spaces in the proposal forms shall be legibly completed for each and every bid item. The Bidder shall not qualify any bid item. The Bidder shall initial any erasures and alterations made on the proposal form by the bidder.
In case of a conflict between a unit price and the corresponding extended amount, or in the absence of an extended amount, the unit price will govern.

Signature of Proposal
An authorized representative of the Bidder must sign and date the proposal. The Bidder's representative shall have the legal authority to obligate and bind the Bidder to the terms and conditions of the contract. The Bidder shall legibly state the name of the Bidder's representative, the legal name of the Bidder, the address of the Bidder including City, State and Zip Code, and the telephone number of the Bidder.

- For bids by corporations, an officer of the corporation shall sign the bid; Bidder shall identify the State of incorporation and affix their corporate seal.
- For bids submitted by an agent, Bidder shall attach to the proposal evidence of the power of attorney.
- For bids submitted by a partnership or joint venture, the proposal shall identify the name of all firms and the authorized parties of all firms. The bidder shall attach a copy of the partnership/joint-venture agreement to the proposal.

Modification or Withdrawal of Bid Proposal
Bidder may modify or withdraw their proposal at any point up to the specified time and date identified for receipt of proposals. Any request for bid withdrawal or modification by the Bidder that is received after the specified time and date for receipt of proposals will be returned unopened to the sender.

Any modification a Bidder desires to make to their proposal, subject to the time constraint noted herein, must be made on the proposal forms contained in the project manual. The Bidder's authorized representative must sign the modification. The modification shall be placed in a sealed envelope and the statement "Modification to Proposal" shall be legibly marked in the upper left-hand corner. Withdrawal of a proposal may be made, subject to the time constraint noted herein, only with written confirmation under signature of the Bidder.

Bid Guaranty
Each bid proposal must include a bid guaranty in the amount of five percent (5%) of the total amount of the bid. The bid guaranty may be by bid bond or certified check made payable to the Owner. The bid bond shall be from a responsible surety qualified to conduct business within the State the project is located. If Bidder uses a certified check, the certified check must be issued from a responsible and solvent bank or trust company.

Disadvantaged Business Enterprise
There is a zero (0%) percent DBE participation requirement for this project. All bidders shall submit, with their proposal, intended DBE participation on the provided DBE Utilization and Letter of Intent forms.

Domestic Violence Policy
In your proposal, please specify whether you currently have, or are in the process of developing, a domestic violence policy. If you do not have such a policy, let us know if you would like to receive a copy of the City of Bangor's policy as a reference.

Bidder Qualifications
Each Bidder shall furnish the owner satisfactory evidence of their competency and financial capability to perform the proposed work. The Bidder shall demonstrate that they are a responsible firm that possesses the skills, abilities, and integrity to faithfully perform the project work. To be determined responsible, a prospective contractor must:

- Have adequate resources (financial, technical, etc.) to perform the contract, or the ability to obtain them;
- Be able to comply with the required or proposed delivery or performance schedule, considering all existing business commitments;
- Have a satisfactory performance record;
- Have a satisfactory record of integrity and business ethics; and
- Be otherwise qualified and eligible to receive an award under applicable laws and regulations.

Evidence of competency shall consist of statements covering the Bidder's past experience on similar work, a listing of plant and equipment immediately available for use on the project, and a listing of key personnel that are available for the project.

Evidence of financial responsibility shall consist of a confidential statement or report of the Bidder's financial resources and liabilities as of the last calendar year.

Each bidder shall show "evidence of competency" and "evidence of financial responsibility" to the Owner at the time of bid opening on "Form 96".

For the Portland Cement Concrete (PCC) Rubblization scope of work, the bidder must show that they, or their subcontractor, has previous experience on a similar PCC rubblization project on an airport. A similar project would be considered large scale rubblization of existing non-reinforced PCC pavement up to 15" thickness.

Submission of Bid Proposal

Prospective bidders must submit one (1) copy of their paper proposal to arrive at the office location below at the specified time and date for receipt of bids. Electronic submissions will NOT be accepted. The owner will not give consideration to any proposal received after the specified time. Owner will return late proposals in an unopened manner to the return address identified on the envelope.

Prospective bidders shall enclose their proposal in a sealed envelope. The envelopes must be clearly identified as "**Proposal No. P26-40: BGR – Taxiway A & M Reconstruction**" by **2:00 P.M., prevailing time, Wednesday April 1, 2026**

Submission of documents can be completed by:

A. **Hand Deliver** to Customer Service, 73 Harlow Street, Bangor, ME
B. **US Post Office** addressed to City of Bangor-Purchasing Department, 73 Harlow Street, Bangor, ME 04401; or
C. **All Other Delivery Services** addressed to City of Bangor-Purchasing Department, 73 Harlow Street, Bangor, ME 04401.

Bid Protest Procedure

Any potential bidder wishing to file a protest concerning alleged improprieties with this solicitation must follow the procedure as outlined in the Special Provisions.

Bid Opening

Sealed bid proposals will be received until 2:00 P.M., prevailing time, Wednesday April 1, 2026, at the office of the CITY OF BANGOR - PURCHASING DEPARTMENT, and at that time will be publicly opened and read, in the Paul Bunyan Room (first floor near the side elevator), 73 Harlow Street, Bangor, Maine 04401.

Evaluation of Proposals

The Owner reserves the rights to hold all proposals for purpose of review and evaluation by the Owner for a period not to exceed 90 calendar days from the stated date for receipt of bids. The Owner will tabulate all bids and verify proper extension of unit costs. The Bidder shall honor their proposal for the duration of this period of review and evaluation. The bid guaranty will be held by the Owner until this period of review has expired or a contract has been formally executed or a purchase order has been issued.

Determination of Low Bidder will be completed as follows:

- The contract will be awarded based upon the lowest qualified bid for the Base Bid plus Additive Alternate #1 plus Additive Alternate #2.

- If the total bid amount for Base Bid plus Additive Alternate #1 plus Additive Alternate #2 exceeds available funding, the contract will be awarded based upon the lowest qualified bid for the base bid plus additive alternate 1.

- If the total bid amount for Base Bid plus Additive Alternate #1 exceeds available funding, the contract will be awarded based upon the lowest qualified bid for the base bid only.

Bid Informalities and Irregularities

The Owner reserves the right to waive any informality or irregularity discovered in any proposal, which in the owner's judgment best serves the Owner's interest. In the situation where an extension of a unit price is found to be incorrect, the stated unit price and correct extension will govern.

Irregular Proposals

Proposals meeting the following criteria are subject to consideration as being irregular:

- If the proposal is on a form other than that furnished by the Owner or Owner's representative.
- If the form furnished by the Owner or Owner's representative is altered from the original document.
- If there are unauthorized additions, conditional or alternate pay items or irregularities of any kind that make the proposal incomplete, indefinite, or otherwise ambiguous.
- If the proposal does not contain a unit price for each pay item listed in the proposal, except in the case of authorized pay items, for which the Bidder is not required to furnish a unit price.
- If the proposal contains unit prices that are obviously unbalanced.
- If the proposal is not accompanied by the bid guarantee specified herein.

Disqualification of Bid Proposals

The Owner reserves the right to reject any or all bids, as determined to be in the best interest of the Owner.

Causes for rejection of proposals include but are not limited to:

- Submittal of an irregular proposal;
- Submittal of more than one proposal from the same partnership, firm or corporation;
- Failure by Bidder to submit the bid prior to the stated time and date for receipt of bids;
- Failure by Bidder to furnish satisfactory bid guarantee;
- Failure by Bidder to provide all information required of the bid forms;
- Failure by Bidder to comply with the requirements of bid instructions;
- Determination by the Owner that Bidder is not qualified to accomplish the project work;
- Determination by the Owner that the Bidder has placed conditions on or qualified their proposal;
- Discovery of any alteration, interlineations or erasure of any project requirement by the Bidder;
- Inclusion of the Bidder on the "Excluded Parties Listing System" as maintained and published by the General Services Administration;
- Evidence of collusion among bidders.

Cancellation of Award

At any time prior to execution of a contract agreement, the Owner reserves the right to cancel the award for any reason without liability to the Bidder, with the exception of the return of the bid guaranty, at any time prior to execution of the contract.

Notice of Award of Contract

It is the intent of the Owner, after a period of review and evaluation, to award a contract to the responsible bidder that submits the lowest responsive proposal. The owner will notify the successful bidder their bid is acceptable through the Owner's issuance of a Notice-of-Award. The successful Bidder shall not construe

issuance of the Notice-of-Award as a binding agreement. The proper execution of a contract agreement shall serve as the binding agreement.

Return of Bid Guaranty
The Owner will return the bid guaranty of the successful Bidder upon successful execution of the contract agreement or issuance of a purchase order. Failure by the successful Bidder to execute the contract documents or commence with the purchase order within the specified time shall result in forfeiture of the bid guaranty.

The Owner will retain the bid guaranty of the second lowest responsible bidder for a period of ninety (90) calendar days after bid opening pending the execution of the contract documents by the successful bidder or the acceptance of the purchase order. Except as noted above, the bid guaranty of unsuccessful bidders will be returned at the point the Owner rejects their proposal.

Contract Agreement
The successful Bidder shall execute the contract agreement in accordance with the accepted bid proposal within 15 days of the date of the Notice-of-Award. Failure to execute the contract agreement within the specified time frame may result in the bid being awarded to the next low bidder and shall result in the forfeiture of the Bidder's bid guarantee as a liquidated damage.

Performance and Payment Bonds
The successful Bidder shall furnish separate performance bond in the amount of 100% of the contract price and a payment bond in the amount of 100% of the contract price. The bonds shall be made payable to the Owner as security for faithful performance of the contract and for the payment of all persons, firms or corporations to whom the Bidder may become legally indebted for labor, materials, tools, equipment or services in the performance of the project work. The form of the bond shall be that provided within the project manual. The current power of attorney for the person signing the bond as a representative of the surety shall be attached to the bonds.

The successful bidding must deliver the executed bonds to the Owner within five (5) calendar days from the date of contract execution. Bonds should not be executed prior to execution of the contract agreement. Owner will only accept bonds issued by a solvent Surety, which is certified to operate within the State the project work is located, and which is listed in the current issue of the U.S. Treasury Circular 570. If specifically requested by the Owner, the successful Bidder shall obtain and submit information on the surety's financial strength rating.

Certificates of Insurance
The successful Bidder shall furnish to the Owner all required certificates of insurance as specified with the project manual.

Approval of the Contract
Upon receipt of the Contract Agreement, Contract Bonds and Certificate of Insurance as executed from the successful Bidder, the Owner will complete execution of the contract conditioned upon the Owner's judgment that it remains in their best interest to enter into the Agreement.

Delivery of the fully executed Contract Agreement to the successful Bidder shall constitute the Owner's approval to be bound by the successful Bidder's proposal and all terms and conditions of the Contract Agreement. Upon satisfactory execution of the contract by the successful Bidder and the Owner, all references to "Bidder" in the bid documents become equivalent to the term "Contractor".

Time for Completion
The work under this contract for this construction shall be started within ten (10) days or as notified by the Owner after the "Construction Notice to Proceed" is issued.

CONTRACT TIMES

BASE BID	60 CALENDAR DAYS
ADDITIVE ALTERNATIVE 1	60 CALENDAR DAYS
ADDITIVE ALTERNATIVE 2	30 CALENDAR DAYS

Liquidated Damages

Liquidated damages for failure to complete the project within the specified time period shall be as detailed in the contract provisions.

Pre-bid Conference - Mandatory

A mandatory Pre-Bid conference will be held in the Terminal building of the Bangor International Airport, 2nd floor, 287 Godfrey Boulevard, Bangor Maine at 10:00 a.m., prevailing time, on March 12, 2026.

Pre-Construction Conference

When the low bidder has been determined and award of contract made, the Contractor, Owner, and Engineer, and other interested persons will be requested to attend and participate in a pre-construction conference. Specific details of safety requirements, administrative, details, construction procedures, construction materials, and other pertinent factors of the project will be discussed.

Construction Activities and Aircraft Operations

Project contains areas of construction that are inside the Aircraft Operations Area (AOA). See plans for notes on security and badging requirements.

Tax Exclusion

All Federal and State taxes must be excluded from the proposal price. Upon request, a tax exemption certificate for the City of Bangor shall be furnished to the successful Proposer.

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Part 2

Proposal Forms

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BASE BID

Failure to complete this form and submit by the Bid Deadline shall result in your Bid being deemed nonresponsive and rejected without any further evaluation.

The Owner reserves the right to change the Estimated Quantities and their respective Item Sub-total and Total Price based on requirements of the Project. The successful Bidder (Contractor) will be paid for quantities installed in accordance with the Basis of Payment section of the Specifications. Unit Prices provided on this Price Form will be the prices used for any quantity additions and deductions required. The Bidder must complete the Price Form either by hand writing in ink or typing prices in the spaces provided. Bidders must provide a Unit Price for all items.

ITEM #	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	ITEM SUBTOTAL
C-100-5.1	Contractor Quality Control Program (CQCP)	LS	1		
C-102-5.1	Installation and Removal of Inlet Protection	EACH	12		
C-102-5.2	Installation and Removal of Silt Fence	LF	4,000		
C-102-5.3	Installation and Removal of Temporary Haybale Check Dam	LF	0		
C-105-5.1	Mobilization	LS	1		
C-105-5.1	Field Office - Engineer	LS	1		
X-106-5.1	Safety and Security	LS	1		
P-101-5.1	Pavement Removal	SY	4,100		
P-101-5.2	Cold Milling - 0-4 Inches	SY	13,000		
P-101-5.3	Cold Milling - 4-6 Inches	SY	25,000		
P-101-5.4	Cold Milling - 6-8 Inches	SY	9,000		
P-101-5.5	Crack Repair	LF	150		
P-152-5.1	Unclassified Excavation	CY	2,600		
P-152-5.1	Test Pit Excavation	CY	100		
P-209-5.1	Crushed Aggregate Base Course	CY	475		
P-215-5.1	Rubblize PCC	SY	19,000		
P-401-5.1	PG 76-22 Asphalt Surface Course	TON	10,500		
P-401-5.2	PG 70-22 Asphalt Base & Shoulder Surface Course	TON	6,000		
P-401-5.3	PG 70-22 Asphalt Leveling Course	TON	2,300		
P-603-5.1	Emulsified Asphalt Tack Coat	GALLON	12,000		
P-620-5.1	Airport Pavement Marking, 50% Rate, Yellow	SF	12,000		
P-620-5.2	Airport Pavement Marking, Yellow, with Reflective Media	SF	12,000		
P-620-5.3	Airport Pavement Marking, Black	SF	14,000		
P-620-5.5	Remove Pavement Marking	SF	70		

ITEM #	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	ITEM SUBTOTAL
D-705-5.4	Remove and Replace and Adjust Existing Cleanout Frame and Cover	EACH	14		
D-751-5.1	Adjust Existing Manhole	EACH	7		
T-901-5.1	Seeding	SY	8,000		
T-905-5.1	Screened Topsoil, From On-Site	CY	2,700		
T-908-5.1	Mulching	SY	8,000		
L-108-5.1	Remove Existing Cable(s) in Conduit or Duct Bank	LF	500		
L-108-5.2	Furnish and Install No. 8 AWG, 5 kV, L-824, Type C Cable in Duct Bank or Conduit	LF	1,800		
L-108-5.3	Furnish and Install No. 6 AWG, Solid, Bare Copper Counterpoise Wire Above the Duct Bank or Conduit	LF	920		
L-110-5.1	Abandonment of Existing Conduit	LF	962		
L-110-5.2	Concrete Encased Electrical Conduit, 1 way 2-inch in Paved Area	LF	920		
L-110-5.3	Expose Existing 2” Schedule 40 PVC Conduit, Cap, and Protect End for Future Conduit Connection	EACH	4		
L-115-5.1	Existing Electrical Manhole/Junction Structure Elevation Adjustment	EACH	9		
L-125-5.1	Furnish and Install L-861T Taxiway Elevated Edge Light Fixture and New L-867B Light Base in Paved Shoulder	EACH	9		
L-125-5.2	Reinstall Stored L-861T Elevated Taxiway Edge Light Fixture and Isolation Transformer on Adjusted Light Base in Paved Shoulder	EACH	36		
L-125-5.4	Furnish and Install Cover Plate on Adjusted Light Base in Paved Shoulder	EACH	2		
L-125-5.5	Removal of L-861T Elevated Taxiway Edge Light Fixture, Isolation Transformer, Extension Collar, and Accessories on Existing Light Base to Remain in Paved Shoulder. Storage of Fixture and Transformer	EACH	38		
L-125-5.7	Removal of Light Base and Accessories	EACH	11		
L-125-5.8	Demolition of Abandoned Guidance Sign Foundation	EACH	2		
X-701-5.2	Underdrain Cleaning, 6-8 inch	LF	3,200		

Base Bid Total Price = $ _____
(Amount in Numerals)

_____
(Amount in Written Words)

BASE BID CONTRACT TIME 60 CALENDAR DAYS

Signature: _____

Title: _____

Company: _____

Date: _____

Email: _____

Additive Alternative #1

Failure to complete this form and submit by the Bid Deadline shall result in your Bid being deemed nonresponsive and rejected without any further evaluation.

The Owner reserves the right to change the Estimated Quantities and their respective Item Sub-total and Total Price based on requirements of the Project. The successful Bidder (Contractor) will be paid for quantities installed in accordance with the Basis of Payment section of the Specifications. Unit Prices provided on this Price Form will be the prices used for any quantity additions and deductions required. The Bidder must complete the Price Form either by hand writing in ink or typing prices in the spaces provided. Bidders must provide a Unit Price for all items.

ITEM #	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	ITEM SUBTOTAL
C-100-5.1	Contractor Quality Control Program (CQCP)	LS	1		
C-102-5.1	Installation and Removal of Inlet Protection	EACH	18		
C-102-5.2	Installation and Removal of Silt Fence	LF	2,500		
C-102-5.3	Installation and Removal of Temporary Haybale Check Dam	LF	150		
C-105-5.1	Mobilization	LS	1		
C-105-5.1	Field Office - Engineer	LS	1		
X-106-5.1	Safety and Security	LS	1		
P-101-5.1	Pavement Removal	SY	2,750		
P-101-5.2	Cold Milling - 0-4 Inches	SY	17,000		
P-101-5.3	Cold Milling - 4-6 Inches	SY	3,500		
P-101-5.4	Cold Milling - 6-8 Inches	SY	4,200		
P-101-5.5	Crack Repair	LF	500		
P-152-5.1	Unclassified Excavation	CY	5,000		
P-152-5.1	Test Pit Excavation	CY	100		
P-209-5.1	Crushed Aggregate Base Course	CY	675		

ITEM #	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	ITEM SUBTOTAL
P-215-5.1	Rubblize PCC	SY	27,000		
P-401-5.1	PG 76-22 Asphalt Surface Course	TON	1,000		
P-401-5.2	PG 70-22 Asphalt Base & Shoulder Surface Course	TON	6,000		
P-401-5.3	PG 70-22 Asphalt Leveling Course	TON	3,500		
P-603-5.1	Emulsified Asphalt Tack Coat	GALLON	15,300		
P-620-5.1	Airport Pavement Marking, 50% Rate, Yellow	SF	15,000		
P-620-5.2	Airport Pavement Marking, Yellow, with Reflective Media	SF	15,000		
P-620-5.3	Airport Pavement Marking, Black	SF	15,000		
P-620-5.4	Surface Painted Hold Position	EACH	2		
P-620-5.5	Remove Pavement Marking	SF	0		
D-705-5.1	6 Inch, Perforated Underdrain, Complete	LF	2,200		
D-705-5.2	Underdrain Cleanout	EACH	11		
D-705-5.3	Underdrain Connection to Stormwater	EACH	1		
D-705-5.4	Remove and Replace and Adjust Existing Cleanout Frame and Cover	EACH	15		
D-705-5.5	Underdrain Rip Rap Apron Outlet	EACH	4		
D-751-5.1	Adjust Existing Manhole	EACH	1		
T-901-5.1	Seeding	SY	17,000		
T-905-5.1	Screened Topsoil, From On-Site	CY	5,500		
T-908-5.1	Mulching	SY	17,000		

ITEM #	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	ITEM SUBTOTAL
L-108-5.1	Remove Existing Cable(s) in Conduit or Duct Bank	LF	675		
L-115-5.1	Existing Electrical Manhole/Junction Structure Elevation Adjustment	EACH	1		
L-125-5.2	Reinstall Stored L-861T Elevated Taxiway Edge Light Fixture and Isolation Transformer on Adjusted Light Base in Paved Shoulder	EACH	37		
L-125-5.5	Removal of L-861T Elevated Taxiway Edge Light Fixture, Isolation Transformer, Extension Collar, and Accessories on Existing Light Base to Remain in Paved Shoulder. Storage of Fixture and Transformer	EACH	37		
L-125-5.9	Removal of Existing Guidance Sign and Demolition of Guidance Sign Foundation	EACH	2		
L-130-5.1	Furnish and Install Surface Sensor and Type IIA Cable	EACH	1		
L-130-5.2	Furnish and Install Vaisala Type V Cable in Duct Bank or Conduit	LF	675		
L-130-5.3	Remove Existing Surface Sensor and Type IIA Cable	EACH	1		
X-701-5.1	Storm Sewer Cleaning 12 to 30 inch	LF	1,700		
X-701-5.2	Underdrain Cleaning, 6-8 inch	LF	6,300		

Additive Alternative #1 Total Price = $ _____
(Amount in Numerals)

_____
(Amount in Written Words)

ADDITIVE ALTERNATIVE #1 CONTRACT TIME 60 CALENDAR DAYS

Signature: _____

Title: _____

Company: _____

Date: _____

Email: _____

Additive Alternative #2

Failure to complete this form and submit by the Bid Deadline shall result in your Bid being deemed nonresponsive and rejected without any further evaluation.

The Owner reserves the right to change the Estimated Quantities and their respective Item Sub-total and Total Price based on requirements of the Project. The successful Bidder (Contractor) will be paid for quantities installed in accordance with the Basis of Payment section of the Specifications. Unit Prices provided on this Price Form will be the prices used for any quantity additions and deductions required. The Bidder must complete the Price Form either by hand writing in ink or typing prices in the spaces provided. Bidders must provide a Unit Price for all items.

ITEM #	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	ITEM SUBTOTAL
C-100-5.1	Contractor Quality Control Program (CQCP)	LS	1		
C-102-5.1	Installation and Removal of Inlet Protection	EACH	3		
C-102-5.2	Installation and Removal of Silt Fence	LF	2,100		
C-105-5.1	Mobilization	LS	1		
C-105-5.1	Field Office - Engineer	LS	1		
X-106-5.1	Safety and Security	LS	1		
P-101-5.1	Pavement Removal	SY	1,200		
P-101-5.2	Cold Milling - 0-4 Inches	SY	15,000		
P-101-5.5	Crack Repair	LF	500		
P-152-5.1	Unclassified Excavation	CY	1,500		
P-152-5.1	Test Pit Excavation	CY	100		
P-209-5.1	Crushed Aggregate Base Course	CY	500		
P-401-5.1	PG 76-22 Asphalt Surface Course	TON	2,700		
P-401-5.2	PG 70-22 Asphalt Base & Shoulder Surface Course	TON	2,100		
P-603-5.1	Emulsified Asphalt Tack Coat	GALLON	3,100		

ITEM #	ITEM DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	ITEM SUBTOTAL
P-620-5.1	Airport Pavement Marking, 50% Rate, Yellow	SF	3,500		
P-620-5.2	Airport Pavement Marking, Yellow, with Reflective Media	SF	3,500		
P-620-5.3	Airport Pavement Marking, Black	SF	5,000		
P-620-5.4	Surface Painted Hold Position	EACH	2		
D-705-5.4	Remove and Replace and Adjust Existing Cleanout Frame and Cover	EACH	2		
D-751-5.1	Adjust Existing Manhole	EACH	4		
T-901-5.1	Seeding	SY	5,000		
T-905-5.1	Screened Topsoil, From On-Site	CY	750		
T-908-5.1	Mulching	SY	5,000		
L-115-5.1	Existing Electrical Manhole/Junction Structure Elevation Adjustment	EACH	5		
L-125-5.2	Reinstall Stored L-861T Elevated Taxiway Edge Light Fixture and Isolation Transformer on Adjusted Light Base in Paved Shoulder	EACH	25		
L-125-5.3	Reinstall Stored L-804 Elevated Runway Guard Light Fixture and Isolation Transformer on Adjusted Light Base in Paved Shoulder	EACH	2		
L-125-5.5	Removal of L-861T Elevated Taxiway Edge Light Fixture, Isolation Transformer, Extension Collar, and Accessories on Existing Light Base to Remain in Paved Shoulder. Storage of Fixture and Transformer	EACH	25		
L-125-5.6	Removal of L-804 Elevated Runway Guard Light Fixture, Isolation Transformer, Extension Collar, and Accessories on Existing Light Base to Remain in Paved Shoulder. Storage of Fixture and Transformer	EACH	2		

Additive Alternative #2 Total Price = $ _____
(Amount in Numerals)

_____
(Amount in Written Words)

ADDITIVE ALTERNATIVE #2 CONTRACT TIME 30 CALENDAR DAYS

Signature: _____

Title: _____

Company: _____

Date: _____

Email: _____

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ACKNOWLEDGEMENTS BY BIDDER

a. By submittal of a proposal, the BIDDER acknowledges and accepts that the quantities established by the OWNER are an approximate estimate of the quantities required to fully complete the Project and that the estimated quantities are principally intended to serve as a basis for evaluation of bids. The BIDDER further acknowledges and accepts that payment under this contract will be made only for actual quantities and that quantities will vary in accordance with the General Provisions subsection entitled "Alteration of Work and Quantities".

b. The BIDDER acknowledges and accepts that the Bid Documents are comprised of the documents identified within the Instructions to Bidders. The BIDDER further acknowledges that each the individual documents that comprise the Bid Documents are complementary to one another and together establishes the complete terms, conditions and obligations of the successful BIDDER.

c. As evidence of good faith in submitting this proposal, the undersigned encloses a bid guaranty in the form of a certified check or bid bond in the amount of **five (5%) of the bid price**. The BIDDER acknowledges and accepts that refusal or failure to accept award and execute a contract within the terms and conditions established herein will result in forfeiture of the bid guaranty to the owner as a liquidated damage.

d. The BIDDER acknowledges and accepts the OWNER'S right to reject any or all bids and to waive any minor informality in any Bid or solicitation procedure.

e. The BIDDER acknowledges and accepts the OWNER'S right to hold all Proposals for purposes of review and evaluation and not issue a notice-of-award for a period not before October 31st, 2026.

f. The undersigned agrees that upon written notice of award of contract, he or she will execute the contract within **fifteen (15) days** of the receival of the contract documents and furthermore and provide executed payment (100% of contract price) and performance bonds (100% of contract price) within **five (5) days** from the date of contract execution. The undersigned accepts that failure to execute the contract and provide the required bonds within the stated timeframe shall result in forfeiture of the bid guaranty to the owner as a liquidated damage.

g. Time of Performance: By submittal of this proposal, the undersigned acknowledges and agrees to commence work within **ten (10) calendar days** of the date specified in the written "Notice-to-Proceed" as issued by the OWNER. The undersigned further agrees to substantially complete the Project within **the contract time as specified in the contract documents.**

h. The undersigned acknowledges and accepts that for each and every calendar day the project remains incomplete beyond the contract time of performance, the Contractor shall pay the non-penal amount(s) as referenced in **Article 6 Liquidated Damages** to the OWNER.

i. The BIDDER acknowledges that the OWNER has established a contract Disadvantaged Business Enterprise goal of zero **(0%)** percent for this project. The BIDDER acknowledges and accepts the requirement to apply and document good faith efforts, as defined in Appendix A, 49 CFR Part 26, for subcontracting a portion of the prime contract to certified Disadvantaged Business Enterprises (DBE), as defined in 49 CFR Part 26 for purposes of meeting the OWNER'S established goal. The BIDDER, in complying with this requirement, proposes participation by Disadvantaged Business Enterprises as stated on the attached forms, "Utilization Statement" and "Letter of Intent".

j. The BIDDER, by submission of a proposal, acknowledges that award of this contract is subject to the provisions of the Davis-Bacon Act. The BIDDER accepts the requirement to pay prevailing wages for each

classification and type of worker as established in the attached wage rate determination as issued by the United States Department of Labor. The BIDDER further acknowledges and accepts their requirement to incorporate the provision to pay the established prevailing wages in every subcontract agreement entered into by the Bidder under this project.

k. Compliance Reports (41 CFR Part 60-1.7): Within 30 days after award of this contract, the Contractor/Subcontractor shall file a compliance report (Standard Form 100) if s/he has not submitted a complete compliance report within 12 months proceeding the date of award. This report is required if the Contractor/Subcontractor meets all of the following conditions:
   1. Contractors/Subcontractors are not exempt based on 41 CFR 60-1,5.
   2. Has 50 or more employees.
   3. Is a prime contractor or first tier subcontractor.
   4. There is a contract, subcontract, or purchase order amounting to $50,000 or more.

l. The undersigned acknowledges receipt of the following addenda:

Addendum Number ___ dated _____ Received_____

Addendum Number ___ dated _____ Received_____

Addendum Number ___ dated _____ Received_____

Addendum Number ___ dated _____ Received_____

REPRESENTATIONS BY BIDDER

By submittal of a proposal (bid), the BIDDER represents the following:

1. The BIDDER has read and thoroughly examined the bid documents including all authorized addenda.
2. The BIDDER has a complete understanding of the terms and conditions required for the satisfactory performance of project work.
3. The BIDDER has fully informed themselves of the project site, the project site conditions and the surrounding area.
4. The BIDDER has familiarized themselves of the requirements of working on an operating airport and understands the conditions that may in any manner affect cost, progress or performance of the work
5. The BIDDER has correlated their observations with that of the project documents.
6. The BIDDER has found no errors, conflicts, ambiguities or omissions in the project documents, except as previously submitted in writing to the owner that would affect cost, progress or performance of the work.
7. The BIDDER is familiar with all applicable Federal, State and local laws, rules and regulations pertaining to execution of the contract and the project work.
8. The BIDDER has complied with all requirements of these instructions and the associated project documents.

CERTIFICATIONS BY BIDDER

a. The undersigned hereby declares and certifies that the only parties interested in this proposal are named herein and that this proposal is made without collusion with any other person, firm or corporation. The undersigned further certifies that no member, officer or agent of OWNER'S has direct or indirect financial interest in this proposal.

a. **Required Contract Provisions:** The BIDDER, as a potential federally-assisted construction contractor, certifies that it is responsible for compliance with all Federal, State, and Local contract provision requirements. The BIDDER (including all subcontractors) shall:

   1. insert these contract provisions in each lower tier contract (subcontract or sub-agreement);
   2. incorporate the applicable requirements of these contract provisions by reference for work done under any purchase orders, rental agreements and other agreements for supplies or services;
   3. be responsible for compliance with these contract provisions by any subcontractor, lower-tier subcontractor or service provider.

ATTACHMENTS TO THIS BID

The following documents are attached to, made a part of and are to be submitted with this Bid:

1. Bid Guaranty in the form of proposal bond/cashier's check/certified check
2. Completed DBE forms "Utilization Statement" and "Letter of Intent".
3. Buy America Certification
4. Tax Delinquency and Felony Convictions
6. Drug-Free Workplace Certifications
7. Statement of Non-Debarment
8. Evidence of good faith efforts required by 49 CFR Part 26, Appendix A. If proposed DBE goal is met, submittal of evidence of good faith efforts is not required.
9. Evidence of BIDDER'S qualifications per the requirements of the Instructions-to-Bidders.
10. Bidder's Domestic Violence Policy or a request for the City of Bangor's policy as a reference.

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SIGNATURE OF BIDDER

IF AN INDIVIDUAL:

Name: _____

By: _____

(Signature of Individual)

Doing Business as: _____

Business Address: _____

_____

Telephone Number: _____

IF A PARTNERSHIP:

Partnership Name: _____

By: _____

(Authorized Signature)

(Attach Evidence of Authority to sign as a Partnership)

Name and Title: _____

Business Address: _____

_____

Telephone Number: _____

IF A CORPORATION:

Corporation Name: _____

By: _____

(Authorized Signature)

(Attach Evidence of Authority to sign)

Name and Title: _____

Business Address: _____ (CORPORATE SEAL)

_____

Telephone Number: _____

ATTEST:

By: _____

(Authorized Signature)

Name and Title: _____

IF A JOINT VENTURE: *(Attach copy of Joint Venture Agreement)*

Joint Venture Name: _____

By: _____

(Authorized Signature)

(Attach Evidence of Authority to sign)

Name and Title: _____

Business Address: _____

_____

Telephone Number: _____

Joint Venture Name: _____

By: _____

(Authorized Signature)

(Attach Evidence of Authority to sign)

Name and Title: _____

Business Address: _____

_____

Telephone Number: _____

SIGNATURE OF BIDDER

IF AN INDIVIDUAL:

Name: _____

By: _____

(Signature of Individual)

Doing Business as: _____

Business Address: _____

_____

Telephone Number: _____

IF A PARTNERSHIP:

Partnership Name: _____

By: _____

(Authorized Signature)

(Attach Evidence of Authority to sign as a Partnership)

Name and Title: _____

Business Address: _____

_____

Telephone Number: _____

IF A CORPORATION:

Corporation Name: _____

By: _____

(Authorized Signature)

(Attach Evidence of Authority to sign)

Name and Title: _____

Business Address: _____ (CORPORATE SEAL)

_____

Telephone Number: _____

ATTEST:

By: _____

(Authorized Signature)

Name and Title: _____

IF A JOINT VENTURE: *(Attach copy of Joint Venture Agreement)*

Joint Venture Name: _____

By: _____

(Authorized Signature)

(Attach Evidence of Authority to sign)

Name and Title: _____

Business Address: _____

_____

Telephone Number: _____

Joint Venture Name: _____

By: _____

(Authorized Signature)

(Attach Evidence of Authority to sign)

Name and Title: _____

Business Address: _____

_____

Telephone Number: _____

BUY AMERICAN PREFERENCE

The Contractor certifies that its bid/offer is in compliance with 49 USC § 50101, BABA and other related Made in America Laws,[1] U.S. statutes, guidance, and FAA policies, which provide that Federal funds may not be obligated unless all iron, steel and manufactured goods used in AIP funded projects are produced in the United States, unless the Federal Aviation Administration has issued a waiver for the product; the product is listed as an Excepted Article, Material Or Supply in Federal Acquisition Regulation subpart 25.108; or is included in the FAA Nationwide Buy American Waivers Issued list.

A bidder or offeror must complete and submit the certification of compliance with FAA's Buy American Preference, BABA and Made in America laws included herein with their bid or offer. The Airport Sponsor/Owner will reject as nonresponsive any bid or offer that does not include a completed certification of compliance with FAA's Buy American Preference and BABA.

The bidder or offeror certifies that all construction materials, defined to mean an article, material, or supply other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives that are or consist primarily of: non-ferrous metals; plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables); glass (including optic glass); lumber; or drywall used in the project are manufactured in the U.S.

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[1] Per Executive Order 14005 "Made in America Laws" means all statutes, regulations, rules, and Executive Orders relating to federal financial assistance awards or federal procurement, including those that refer to "Buy America" or "Buy American," that require, or provide a preference for, the purchase or acquisition of goods, products, or materials produced in the United States, including iron, steel, manufactured products offered in the United States.

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Certificate of Buy American Compliance for Manufactured Products

As a matter of bid responsiveness, the bidder or offeror must complete, sign, date, and submit this certification statement with their proposal. The bidder or offeror must indicate how they intend to comply with 49 USC § 50101 by selecting one on the following certification statements. These statements are mutually exclusive. Bidder must select one or the other (not both) by inserting a checkmark (✓) or the letter "X".

☐ Bidder or offeror hereby certifies that it will comply with 49 USC § 50101 by:

a) Only installing steel and manufactured products produced in the United States;
b) Installing manufactured products for which the Federal Aviation Administration (FAA) has issued a waiver as indicated by inclusion on the current FAA Nationwide Buy American Waivers Issued listing; or
c) Installing products listed as an Excepted Article, Material or Supply in Federal Acquisition Regulation Subpart 25.108.

By selecting this certification statement, the bidder or offeror agrees:

1. To provide to the Owner evidence that documents the source and origin of the steel and manufactured product.
2. To faithfully comply with providing U.S. domestic product.
3. To furnish U.S. domestic product for any waiver request that the FAA rejects
4. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

☐ The bidder or offeror hereby certifies it cannot comply with the 100 percent Buy American Preferences of 49 USC § 50101(a) but may qualify for either a Type 3 or Type 4 waiver under 49 USC § 50101(b). By selecting this certification statement, the apparent bidder or offeror with the apparent low bid agrees:

1. To the submit to the Owner within 15 calendar days of the bid opening, a formal waiver request and required documentation that supports the type of waiver being requested.
2. That failure to submit the required documentation within the specified timeframe is cause for a non-responsive determination may result in rejection of the proposal.
3. To faithfully comply with providing U.S. domestic products at or above the approved U.S. domestic content percentage as approved by the FAA.
4. To refrain from seeking a waiver request after establishment of the contract, unless extenuating circumstances emerge that the FAA determines justified.

Required Documentation

Type 3 Waiver – The cost of the item components and subcomponents produced in the United States is more that 60 percent of the cost of all components and subcomponents of the "item". The required documentation for a Type 3 waiver is:

a) Listing of all product components and subcomponents that are not comprised of 100 percent U.S. domestic content (Excludes products listed on the FAA Nationwide Buy American Waivers Issued listing and products excluded by Federal Acquisition Regulation Subpart

25.108; products of unknown origin must be considered as non-domestic products in their entirety).

b) Cost of non-domestic components and subcomponents, excluding labor costs associated with final assembly at place of manufacture.
c) Percentage of non-domestic component and subcomponent cost as compared to total “item” component and subcomponent costs, excluding labor costs associated with final assembly at place of manufacture.

Type 4 Waiver – Total cost of project using U.S. domestic source product exceeds the total project cost using non-domestic product by 25 percent. The required documentation for a Type 4 of waiver is:

a) Detailed cost information for total project using U.S. domestic product
b) Detailed cost information for total project using non-domestic product

False Statements: Per 49 USC § 47126, this certification concerns a matter within the jurisdiction of the Federal Aviation Administration and the making of a false, fictitious or fraudulent certification may render the maker subject to prosecution under Title 18, United States Code.

Date	Signature
Company Name	Title

CERTIFICATION OF BIDDER REGARDING TAX DELINQUENCY AND FELONY CONVICTIONS:

The BIDDER must complete the following two certification statements. The BIDDER must indicate its current status as it relates to tax delinquency and felony conviction by inserting a checkmark (✓) or the letter "X" in the space following the applicable response. The BIDDER agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification in all lower tier subcontracts.

1) The BIDDER represents that it is ☐ is not ☐ a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting tax liability.

2) The BIDDER represents that it is ☐ is not ☐ a corporation that was convicted of a criminal violation under any Federal law within the preceding 24 months.

Note: If a BIDDER responds in the affirmative to either of the above representations, the BIDDER is ineligible to receive an award unless the SPONSOR has received notification from the agency suspension and debarment official (SDO) that the SDO has considered suspension or debarment and determined that further action is not required to protect the Government's interests. The BIDDER therefore must provide information to the SPONSOR about its tax liability or conviction to the SPONSOR, who will then notify the FAA Airports District Office, which will then notify the agency's SDO to facilitate completion of the required considerations before award decisions are made.

Term Definitions

Felony conviction: Felony conviction means a conviction within the preceding twenty-four (24) months of a felony criminal violation under any Federal law and includes conviction of an offense defined in a section of the U.S. code that specifically classifies the offense as a felony and conviction of an offense that is classified as a felony under 18 U.S.C. § 3559.

Tax Delinquency: A tax delinquency is any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

_____ _____

Date Signature

_____ _____

Company Name Title

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Statement of Non-Debarment & Contract Completion

I, _____, representing _____, do hereby state
(Company Official) (Company)

that _____ is not debarred, suspended, or otherwise prohibited from providing
(Company)

construction services by any Federal, State, of Local agency.

Furthermore, I, _____, representing _____, do
Company Official) (Company)

hereby state that _____ has not stopped by any Owner from completing a
(Company)

contracted project for cause.

_____ _____

Company Official Signature Date

NOTARY PUBLIC SEAL

Witnessed this day, _____ By _____

My commission expired on _____

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Part 3

Contract & Bond Forms

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PERFORMANCE BOND

Bond Number

PRINCIPAL *(Legal Name and Business Address)* | STATE OF INCORPORATION

SURETY *(Legal Name and Business Address)*	CONTRACT NO.	CONTRACT DATE

PENAL SUM OF BOND *(Expressed in words and numerals)*

OBLIGATION

KNOW ALL PERSONS BY THESE PRESENTS, that the above named PRINCIPAL, hereinafter referred to and called CONTRACTOR, and the above named SURETY hereby bind themselves unto Bangor International Airport , as OBLIGEE, hereinafter referred to and called OWNER, in the penal sum stated above, in lawful money of the United States of America to be paid to OWNER. For payment of the penal sum, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

CONTRACTOR has entered into the written contract agreement identified hereinabove with the OWNER for the following project:

Project Name: Reconstruct Taxiway 'A' (2,081 ± lf x 75') And Rehabilitate Taxiway 'A' (1,056 ± lf x 75') – Base Bid

Reconstruct Taxiway 'A' (3,643 ± lf x 75') And Rehabilitate Taxiway 'A' (383 ± lf x 75') – Additive Alternate #1

Rehabilitate Taxiway 'M' (900 ± lf x 75') – Additive Alternate #2

Project Location: Bangor International Airport

which said contract and associated contract documents, including any present or future amendment thereto, is incorporated herein by reference and is hereinafter referred to as the Contract.

CONDITION

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if CONTRACTOR shall promptly and faithfully perform all undertakings, covenants, terms, conditions and agreements of the Contract during the original term of the Contract and any extensions thereof that are granted by the OWNER, with or without notice to the SURETY, and during the period of any guarantee or warranties required under the Contract, and if CONTRACTOR shall perform and fulfill all undertakings, covenants, terms, conditions and agreements of any and all duly authorized modifications of the Contract that hereafter are made, then this obligation shall be void; otherwise it shall remain in full force and effect subject to the following additional conditions:

1. SURETY, for value received, hereby stipulates and agrees that no change, extension of time, modification, omission, addition or change in or to the Contract, or the work performed thereunder or the specifications accompanying the same, shall in any way affect the SURETY'S obligation on this bond; and SURETY hereby agrees to waive notice of any and all such extensions, modifications, omissions, alterations, and additions to the terms of the Contract, work or specifications.
2. Whenever CONTRACTOR shall be and declared by the OWNER to be in default under the Contract, the Surety shall promptly and at the SURETY'S expense remedy the default by implementing one or more of the following actions:
    a. Arrange for the CONTRACTOR, with consent of the OWNER, to perform and complete the Contract; or
    b. Undertake to perform and complete the Contract itself, through its agents or through independent contractors; or

c. Obtain bids or negotiated proposals from qualified contractors acceptable to the OWNER for a contract for performance and completion of the Contract; arrange for a contract to be prepared for execution by the OWNER and the contractor selected with the OWNER'S concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the Bonds issued on the Contract; and make available as work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the contract price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the penal sum of the bond. The term "balance of the contract price", as used in this paragraph, shall mean the total amount payable by OWNER to CONTRACTOR under the Contract and any amendments thereto, disbursed at the rate provided in the original contract, less the amount properly paid by OWNER to CONTRACTOR.

d. With written consent of the OWNER, SURETY may waive its right to perform and complete, arrange for completion or obtain a new contractor and with reasonable promptness, investigate and determine the amount the SURETY is liable to the OWNER and tender payment therefor to the OWNER.

3. CONTRACTOR and SURETY agree that if in connection with the enforcement of this Bond, the OWNER is required to engage the services of an attorney, that reasonable attorney fees incurred by the OWNER, with or without suit, are in addition to the balance of the contract price.

4. No right of action shall accrue on this bond to or for the use of any person or corporation other than the OWNER named herein or the successors or assigns of the OWNER.

WITNESS

In witness whereof, this instrument is executed this the _____ day of _____, 20___.

INDIVIDUAL PRINCIPAL:

Company Name: _____

Signature: _____

Name and Title: _____

CORPORATE PRINCIPAL:

ATTEST**:**

Corporate Name: _____

Signature: _____

Signature: _____

Name and Title: _____

Name and Title: _____

(Affix Corporate Seal)

SURETY:

ATTEST**:**

Surety Name: _____

Signature: _____

Signature: _____

Name and Title: _____

Name and Title: _____

(Affix Seal)

(Attach Power of Attorney)

OWNER ACCEPTANCE

The OWNER approves the form of this Performance Bond.

Date: _____

Signature: _____

Name and Title: _____

ATTEST:

Signature: _____

Name and Title: _____

PAYMENT BOND

Bond Number

PRINCIPAL *(Legal Name and Business Address)* | STATE OF INCORPORATION

SURETY *(Legal Name and Business Address)*	CONTRACT NO.	CONTRACT DATE

PENAL SUM OF BOND *(Expressed in words and numerals)*

OBLIGATION

KNOW ALL PERSONS BY THESE PRESENTS, that the above named PRINCIPAL, hereinafter referred to and called CONTRACTOR, and the above named SURETY hereby bind themselves unto The City Of Bangor, as OBLIGEE, hereinafter referred to and called OWNER, in the penal sum stated above, in lawful money of the United States of America to be paid to OWNER. For payment of the penal sum, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS,

CONTRACTOR has entered into the written contract agreement identified hereinabove with the OWNER for the following project:

Project Name: Reconstruct Taxiway 'A' (2,081 ± Lf X 75') And Rehabilitate Taxiway 'A' (1,056 ± Lf X 75') – Base Bid

Reconstruct Taxiway 'A' (3,643 ± Lf X 75') And Rehabilitate Taxiway 'A' (383 ± Lf X 75') – Additive Alternate #1

Rehabilitate Taxiway 'M' (900 ± Lf X 75') – Additive Alternate #2

Project Location: Bangor International Airport

which said contract and associated contract documents, including any present or future amendment thereto, is incorporated herein by reference and is hereinafter referred to as the Contract.

CONDITION

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that, if CONTRACTOR shall promptly make payment to all employees, persons, firms or corporations for all incurred indebtedness and just claims for labor, supplies, materials and services furnished for or used in connection with the performance of the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect subject to the following additional conditions:

1. CONTRACTOR and SURETY indemnify and hold harmless the OWNER for all claims, demands, liens or suits that arise from performance of the Contract
2. SURETY, for value received, hereby stipulates and agrees that no change, extension of time, modification, omission, addition or change in or to the Contract, or the work performed thereunder or the specifications accompanying the same, shall in any way affect the SURETY'S obligation on this bond; and SURETY hereby agrees to waive notice of any and all such extensions, modifications, omissions, alterations, and additions to the terms of the Contract, work or specifications.
3. No final settlement between the OWNER and the CONTRACTOR shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

4. The amount of this bond shall be reduced by and to the extent of any payments made in good faith hereunder.

5. Amounts owed by the OWNER to the CONTRACTOR under the Contract shall be used for the performance of the Contract and to satisfy claims, if any, under any Performance Bond. By the CONTRACTOR furnishing and the OWNER accepting this Bond, they agree that all funds earned by the CONTRACTOR in the performance of the Contract are dedicated to satisfy obligations of the CONTRACTOR and the SURETY under this Bond, subject to the OWNER'S priority to use the funds for the completion of the project.

WITNESS

In witness whereof, this instrument is executed this the _____ day of _____, 20___.

INDIVIDUAL PRINCIPAL:

Company Name: _____

Signature: _____

Name and Title: _____

CORPORATE PRINCIPAL:

ATTEST**:**

Corporate Name: _____

Signature: _____ Signature: _____

Name and Title: _____ Name and Title: _____

(Affix Corporate Seal)

SURETY:

ATTEST**:**

Surety Name: _____

Signature: _____ Signature: _____

Name and Title: _____ Name and Title: _____

(Affix Seal) (Attach Power of Attorney)

OWNER ACCEPTANCE

The OWNER approves the form of this Payment Bond.

Date: _____ Signature: _____

Name and Title: _____

ATTEST:

Signature: _____

Name and Title: _____

(Affix Seal)

CONTRACT

THIS AGREEMENT, made and executed this _____ day of _____ in the year Two Thousand Twenty-Six by and between the City of Bangor, County of Penobscot, in the State of Maine, being herein termed the OWNER, party of the first part, and XXX, Bangor, State of Maine, County of Penobscot, 04401, hereinafter termed the CONTRACTOR, party of the second part;

WITNESSETH: That for and in consideration of the payments and agreements hereinafter mentioned, the CONTRACTOR hereby agrees with the OWNER to commence and complete the following work:

Base Bid: Reconstruct Taxiway 'A' (2,081 ± LF x 75') and Rehabilitate Taxiway 'A' (1,056 ± LF x 75'),
Additive Alternate #1: Reconstruct Taxiway 'A' (3,643 ± LF x 75') and Rehabilitate Taxiway 'A' (383 ± LF x 75'),
Additive Alternate #2: Rehabilitate Taxiway 'M' (900 ± LF x 75')
(FAA AIP No.: 3-23-0005-0xx-202x)

hereinafter called the PROJECT, for the Contract Bid Price recorded in the UNIT PRICE BID FORM, and all extra work in connection therewith, under the terms as stated in the Performance, Labor and Material Bonds and the General Provisions; and at his/her (its or their) own proper cost and expense to furnish all the materials, supplies, machinery, equipment, tools, superintendence, labor, insurance, and other accessories and services necessary to complete the said PROJECT in accordance with the conditions and prices stated in the Executed Invitation to Bid, Executed Instructions to Bidders, Executed Bid Proposal, General Provisions, Supplemental Provisions, Contract Provisions, Construction Safety and Phasing Plan, DBE Plan, and Documents, Contract Plans/Drawings, Specifications and all Addenda listed below; all of which are made a part hereof and collectively evidence and constitute the Contract.

Addendum No.	Dated
XXXXXXXXXX	**XXXX**

The OWNER is exempt from paying sales or use tax by State of Maine statute and has been issued a Permanent Exemption Certification by the State of Maine.
Permanent Exemption Certificate Number: E81590
Federal Identification Number: 016000020

As a federally funded Project the following provisions are required to be included in the contract, ***including all subcontracts***. Failure to comply with the terms of these contract provisions may be sufficient grounds to withhold payments, terminate the contract, seek suspension/debarment, or any other action determined to be appropriate by the OWNER in full compliance to the Federal Aviation Administration rules and regulations.

Please reference the "Required Contract Provisions for Airport Improvement Program and for Obligated Sponsors" section of the specifications for the full requirements.

Access to Records and Reports – 2 CFR§200.333, 2 CFR§200.336, FAA Order 5100.38
Affirmative Action Requirement - 41 CFR part 60-4, Executive Order 11246
Breach of Contract Terms - 2 CFR § 200 Appendix II(A)
Buy American Preference - 49 USC § 50101
Civil Rights General - 49 USC § 47123
Clean Air and Water Pollution Control - 2 CFR § 200, Appendix II(G)
Contract Workhours and Safety Standards Act - 2 CFR § 200 Appendix II (E)
Copeland "Anti-Kickback" Act - 2 CFR § 200 Appendix II(D), 29 CFR parts 3 & 5
Davis-Bacon Requirements - 2 CFR § 200 Appendix II(D), 29 CFR Part 5
Debarment and Suspension - 2 CFR part 180 (Subpart C), 2 CFR part 1200, DOT Order 4200.5
Disadvantaged Business Enterprise - 49 CFR part 26
Distracted Driving - Executive Order 13513, and DOT Order 3902.10
Prohibition On Certain Telecommunications And Video Surveillance Services Or Equipment -2 CFR § 200, Appendix II(K), 2 CFR § 200.216
Equal Employment Opportunity (E.E.O) – 2 CFR 200 Appendix II(C), 41 CFR § 60-1.4, 41 CFR §60-4.3, Executive Order 11246
Federal Fair Labor Standards Act (Federal Minimum Wage) - 29 USC § 201, et seq.
Lobbying and Influencing Federal Employees - 31 U.S.C. § 1352, 2 CFR part 200 Appendix II(J), 49 CFR part 20, Appendix A
Prohibition of Segregated Facilities - 41 CFR § 60
Occupational Safety and Health Act of 1970 - 20 CFR part 1910
Procurement of Recovered Materials – 2 CFR § 200.322, 40 CFR part 247
Seismic Safety – 49 CFR part 41
Tax Delinquency and Felony Convictions
Termination of Contract - 2 CFR § 200 Appendix II(B), FAA AC 150/5370-10, Sec. 80-09
Trade Restriction Certification – 49 USC §50104, 49 CFR part 30
Veteran's Preference - 49 USC § 47112(c)
Certification Regarding Domestic Preferences For Procurements - 2 CFR § 200.322; 2 CFR Part 200, Appendix II(L)

The CONTRACTOR further agrees that the OWNER reserves the right to eliminate, omit or reorder the work associated with any or all the Work Areas, as shown on the Plans. Such elimination or reordering of the work shall not constitute a basis for claim by the CONTRACTOR for damages, delay, adjustment of the unit prices quoted in the Unit Price Bid Form in the Proposal, or additional Contract time.

The CONTRACTOR understands that the OWNER shall have the authority to postpone the issuance of the notice to proceed with the work and/or to suspend the work wholly, or in part, for such periods as the OWNER may deem necessary, due to unsuitable weather or such other conditions as are considered unfavorable for the suitable prosecution of work.

THE CONTRACTOR hereby agrees to commence work under this Contract within 10-days of or before a date to be specified in a written "Notice to Proceed" by the OWNER and to fully complete the project within the calendar days, as detailed in the General Provisions of the Contract Documents; and the CONTRACTOR further agrees to pay to the OWNER, as liquidated damages, the sum of **$1,500.00** for each and every calendar day the work remains incomplete, as specifically detailed in the Contract Documents and Section 80-08 of the General Provisions, as hereinafter provided in the General Provisions; and the CONTRACTOR

represents that he/she has informed himself/herself fully in regard to all conditions pertaining to the place where the work is to be done and other circumstances affecting the work; and

That the OWNER shall pay (as may prove convenient under the OWNER'S system of monthly audit and payment of bills) and the CONTRACTOR shall receive as full compensation for fulfilling everything required of the CONTRACTOR under this Contract, the amount of **$XXXX (IN WORD).**, (the total price recorded in the schedule of prices) subject to additions and deductions as provided in the specifications.

This AGREEMENT shall be governed by the laws of the State of Maine. Any action by either party to enforce the terms of this AGREEMENT shall be brought in the courts of the State of Maine, sitting in Bangor, Maine, County of Penobscot.

Signed, sealed, and delivered to the OWNER on the day and year first above written.

CITY OF BANGOR, MAINE

By: _____
XXXX
Finance Director

Witnessed:

_____
Notary Public
My Commission Expires:_____

(SEAL)

Witnessed:

By: _____
XXX
XXX `

_____
Notary Public
My Commission Expires:_____

(SEAL)

Witnessed:

* Execute acknowledgment of the officer or agent of the officer or agent of the Contractor who signs this document. Use proper form on next page.

Approved as to Form

By:_____
(name)

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Part 4

Provisions

Part 1 – General Contract Provisions

Section 10 Definition of Terms

When the following terms are used in these specifications, in the contract, or in any documents or other instruments pertaining to construction where these specifications govern, the intent and meaning shall be defined as follows:

Paragraph Number	Term	Definition
10-01	**AASHTO**	The American Association of State Highway and Transportation Officials.
10-02	**Access Road**	The right-of-way, the roadway and all improvements constructed thereon connecting the airport to a public roadway.
10-03	**Advertisement**	A public announcement, as required by local law, inviting bids for work to be performed and materials to be furnished.
10-04	**Airport**	Airport means an area of land or water which is used or intended to be used for the landing and takeoff of aircraft; an appurtenant area used or intended to be used for airport buildings or other airport facilities or rights of way; airport buildings and facilities located in any of these areas, and a heliport.
10-05	**Airport Improvement Program (AIP)**	A grant-in-aid program, administered by the Federal Aviation Administration (FAA).
10-06	**Air Operations Area (AOA)**	The term air operations area (AOA) shall mean any area of the airport used or intended to be used for the landing, takeoff, or surface maneuvering of aircraft. An air operation area shall include such paved or unpaved areas that are used or intended to be used for the unobstructed movement of aircraft in addition to its associated runway, taxiway, or apron.
10-07	**Apron**	Area where aircraft are parked, unloaded or loaded, fueled and/or serviced.
10-08	**ASTM International (ASTM)**	Formerly known as the American Society for Testing and Materials (ASTM).

Paragraph Number	Term	Definition
10-09	**Award**	The Owner's notice to the successful bidder of the acceptance of the submitted bid.
10-10	**Bidder**	Any individual, partnership, firm, or corporation, acting directly or through a duly authorized representative, who submits a proposal for the work contemplated.
10-11	**Building Area**	An area on the airport to be used, considered, or intended to be used for airport buildings or other airport facilities or rights-of-way together with all airport buildings and facilities located thereon.
10-12	**Calendar Day**	Every day shown on the calendar.
10-13	**Certificate of Analysis (COA)**	The COA is the manufacturer's Certificate of Compliance (COC) including all applicable test results required by the specifications.
10-14	**Certificate of Compliance (COC)**	The manufacturer's certification stating that materials or assemblies furnished fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer's authorized representative.
10-15	**Change Order**	A written order to the Contractor covering changes in the plans, specifications, or proposal quantities and establishing the basis of payment and contract time adjustment, if any, for work within the scope of the contract and necessary to complete the project.
10-16	**Contract**	A written agreement between the Owner and the Contractor that establishes the obligations of the parties including but not limited to performance of work, furnishing of labor, equipment and materials and the basis of payment. The awarded contract includes but may not be limited to: Advertisement, Contract form, Proposal, Performance bond, payment bond, General provisions, certifications and representations, Technical Specifications, Plans, Supplemental Provisions, standards incorporated by reference and issued addenda.
10-17	**Contract Item (Pay Item)**	A specific unit of work for which a price is provided in the contract.
10-18	**Contract Time**	The number of calendar days or working days, stated in the proposal, allowed for completion of the contract, including authorized time extensions. If a calendar date of

Paragraph Number	Term	Definition
		completion is stated in the proposal, in lieu of a number of calendar or working days, the contract shall be completed by that date.
10-19	**Contractor**	The individual, partnership, firm, or corporation primarily liable for the acceptable performance of the work contracted and for the payment of all legal debts pertaining to the work who acts directly or through lawful agents or employees to complete the contract work.
10-20	**Contractors Quality Control (QC) Facilities**	The Contractor's QC facilities in accordance with the Contractor Quality Control Program (CQCP).
10-21	**Contractor Quality Control Program (CQCP)**	Details the methods and procedures that will be taken to assure that all materials and completed construction required by the contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors.
10-22	**Control Strip**	A demonstration by the Contractor that the materials, equipment, and construction processes results in a product meeting the requirements of the specification.
10-23	**Construction Safety and Phasing Plan (CSPP)**	The overall plan for safety and phasing of a construction project developed by the airport operator, or developed by the airport operator's consultant and approved by the airport operator. It is included in the invitation for bids and becomes part of the project specifications.
10-24	**Drainage System**	The system of pipes, ditches, and structures by which surface or subsurface waters are collected and conducted from the airport area.
10-25	**Engineer**	The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for engineering, inspection, and/or observation of the contract work and acting directly or through an authorized representative.
10-26	**Equipment**	All machinery, together with the necessary supplies for upkeep and maintenance; and all tools and apparatus necessary for the proper construction and acceptable completion of the work.
10-27	**Extra Work**	An item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, but which is found by the Owner's Engineer or

Paragraph Number	Term	Definition
		Resident Project Representative (RPR) to be necessary to complete the work within the intended scope of the contract as previously modified.
10-28	**FAA**	The Federal Aviation Administration. When used to designate a person, FAA shall mean the Administrator or their duly authorized representative.
10-29	**Federal Specifications**	The federal specifications and standards, commercial item descriptions, and supplements, amendments, and indices prepared and issued by the General Services Administration.
10-30	**Force Account**	**a.** Contract Force Account - A method of payment that addresses extra work performed by the Contractor on a time and material basis. **b.** Owner Force Account - Work performed for the project by the Owner's employees.
10-31	**Intention of Terms**	Whenever, in these specifications or on the plans, the words “directed,” “required,” “permitted,” “ordered,” “designated,” “prescribed,” or words of like import are used, it shall be understood that the direction, requirement, permission, order, designation, or prescription of the Engineer and/or Resident Project Representative (RPR) is intended; and similarly, the words “approved,” “acceptable,” “satisfactory,” or words of like import, shall mean approved by, or acceptable to, or satisfactory to the Engineer and/or RPR, subject in each case to the final determination of the Owner. Any reference to a specific requirement of a numbered paragraph of the contract specifications or a cited standard shall be interpreted to include all general requirements of the entire section, specification item, or cited standard that may be pertinent to such specific reference.
10-32	**Lighting**	A system of fixtures providing or controlling the light sources used on or near the airport or within the airport buildings. The field lighting includes all luminous signals, markers, floodlights, and illuminating devices used on or near the airport or to aid in the operation of aircraft landing at, taking off from, or taxiing on the airport surface.
10-33	**Major and Minor Contract Items**	A major contract item shall be any item that is listed in the proposal, the total cost of which is equal to or greater than

Paragraph Number	Term	Definition
		20% of the total amount of the award contract. All other items shall be considered minor contract items.
10-34	**Materials**	Any substance specified for use in the construction of the contract work.
10-35	**Modification of Standards (MOS)**	Any deviation from standard specifications applicable to material and construction methods in accordance with FAA Order 5300.1.
10-36	**Notice to Proceed (NTP)**	A written notice to the Contractor to begin the actual contract work on a previously agreed to date. If applicable, the Notice to Proceed shall state the date on which the contract time begins.
10-37	**Owner**	The term "Owner" shall mean the party of the first part or the contracting agency signatory to the contract. Where the term "Owner" is capitalized in this document, it shall mean airport Sponsor only. The Owner for this project is the St Joseph County Airport Authority.
10-38	**Passenger Facility Charge (PFC)**	Per 14 Code of Federal Regulations (CFR) Part 158 and 49 United States Code (USC) § 40117, a PFC is a charge imposed by a public agency on passengers enplaned at a commercial service airport it controls.
10-39	**Pavement Structure**	The combined surface course, base course(s), and subbase course(s), if any, considered as a single unit.
10-40	**Payment bond**	The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will pay in full all bills and accounts for materials and labor used in the construction of the work.
10-41	**Performance bond**	The approved form of security furnished by the Contractor and their own surety as a guaranty that the Contractor will complete the work in accordance with the terms of the contract.
10-42	**Plans**	The official drawings or exact reproductions which show the location, character, dimensions and details of the airport and the work to be done and which are to be considered as a part of the contract, supplementary to the specifications. Plans may also be referred to as 'contract drawings.'

Paragraph Number	Term	Definition
10-43	**Project**	The agreed scope of work for accomplishing specific airport development with respect to a particular airport.
10-44	**Proposal**	The written offer of the bidder (when submitted on the approved proposal form) to perform the contemplated work and furnish the necessary materials in accordance with the provisions of the plans and specifications.
10-45	**Proposal guaranty**	The security furnished with a proposal to guarantee that the bidder will enter into a contract if their own proposal is accepted by the Owner.
10-46	**Quality Assurance (QA)**	Owner's responsibility to assure that construction work completed complies with specifications for payment.
10-47	**Quality Control (QC)**	Contractor's responsibility to control material(s) and construction processes to complete construction in accordance with project specifications.
10-48	**Quality Assurance (QA) Inspector**	An authorized representative of the Engineer and/or Resident Project Representative (RPR) assigned to make all necessary inspections, observations, tests, and/or observation of tests of the work performed or being performed, or of the materials furnished or being furnished by the Contractor.
10-49	**Quality Assurance (QA) Laboratory**	The official quality assurance testing laboratories of the Owner or such other laboratories as may be designated by the Engineer or RPR. May also be referred to as Engineer's, Owner's, or QA Laboratory.
10-50	**Resident Project Representative (RPR)**	The individual, partnership, firm, or corporation duly authorized by the Owner to be responsible for all necessary inspections, observations, tests, and/or observations of tests of the contract work performed or being performed, or of the materials furnished or being furnished by the Contractor, and acting directly or through an authorized representative.
10-51	**Runway**	The area on the airport prepared for the landing and takeoff of aircraft.
10-52	**Runway Safety Area (RSA)**	A defined surface surrounding the runway prepared or suitable for reducing the risk of damage to aircraft. See the construction safety and phasing plan (CSPP) for limits of the RSA.

Paragraph Number	Term	Definition
10-53	**Safety Plan Compliance Document (SPCD)**	Details how the Contractor will comply with the CSPP.
10-54	**Specifications**	A part of the contract containing the written directions and requirements for completing the contract work. Standards for specifying materials or testing which are cited in the contract specifications by reference shall have the same force and effect as if included in the contract physically.
10-55	**Sponsor**	A Sponsor is defined in 49 USC § 47102(24) as a public agency that submits to the FAA for an AIP grant; or a private Owner of a public-use airport that submits to the FAA an application for an AIP grant for the airport.
10-56	**Structures**	Airport facilities such as bridges; culverts; catch basins, inlets, retaining walls, cribbing; storm and sanitary sewer lines; water lines; underdrains; electrical ducts, manholes, handholes, lighting fixtures and bases; transformers; navigational aids; buildings; vaults; and, other manmade features of the airport that may be encountered in the work and not otherwise classified herein.
10-57	**Subgrade**	The soil that forms the pavement foundation.
10-58	**Superintendent**	The Contractor's executive representative who is present on the work during progress, authorized to receive and fulfill instructions from the RPR, and who shall supervise and direct the construction.
10-59	**Supplemental Agreement**	A written agreement between the Contractor and the Owner that establishes the basis of payment and contract time adjustment, if any, for the work affected by the supplemental agreement. A supplemental agreement is required if: (1) in scope work would increase or decrease the total amount of the awarded contract by more than 25%: (2) in scope work would increase or decrease the total of any major contract item by more than 25%; (3) work that is not within the scope of the originally awarded contract; or (4) adding or deleting of a major contract item.
10-60	**Surety**	The corporation, partnership, or individual, other than the Contractor, executing payment or performance bonds that are furnished to the Owner by the Contractor.
10-61	**Taxilane**	A taxiway designed for low speed movement of aircraft between aircraft parking areas and terminal areas.

Paragraph Number	Term	Definition
10-62	**Taxiway**	The portion of the air operations area of an airport that has been designated by competent airport authority for movement of aircraft to and from the airport's runways, aircraft parking areas, and terminal areas.
10-63	**Taxiway/Taxilane Safety Area (TSA)**	A defined surface alongside the taxiway prepared or suitable for reducing the risk of damage to an aircraft. See the construction safety and phasing plan (CSPP) for limits of the TSA.
10-64	**Work**	The furnishing of all labor, materials, tools, equipment, and incidentals necessary or convenient to the Contractor's performance of all duties and obligations imposed by the contract, plans, and specifications.
10-65	**Working day**	A working day shall be any day other than a legal holiday, Saturday, or Sunday on which the normal working forces of the Contractor may proceed with regular work for at least six (6) hours toward completion of the contract. When work is suspended for causes beyond the Contractor's control, it will not be counted as a working day. Saturdays, Sundays and holidays on which the Contractor's forces engage in regular work will be considered as working days.
10-66	**Owner Defined terms**	None

END OF SECTION 10

Section 20 Proposal Requirements and Conditions

20-01 Advertisement (Notice to Bidders). Included in Part 1 of the Contract Legal Documents and Specifications

20-02 Qualification of bidders. Each bidder shall submit evidence of competency and evidence of financial responsibility to perform the work to the Owner at the time of bid opening.

Evidence of competency, unless otherwise specified, shall consist of statements covering the bidder's past experience on similar work, and a list of equipment and a list of key personnel that would be available for the work.

Each bidder shall furnish the Owner satisfactory evidence of their financial responsibility. Evidence of financial responsibility, unless otherwise specified, shall consist of a confidential statement or report of the bidder's financial resources and liabilities as of the last calendar year or the bidder's last fiscal year. Such statements or reports shall be certified by a public accountant. At the time of submitting such financial statements or reports, the bidder shall further certify whether their financial responsibility is approximately the same as stated or reported by the public accountant. If the bidder's financial responsibility has changed, the bidder shall qualify the public accountant's statement or report to reflect the bidder's true financial condition at the time such qualified statement or report is submitted to the Owner.

Unless otherwise specified, a bidder may submit evidence that they are prequalified with the State Highway Division and are on the current "bidder's list" of the state in which the proposed work is located. Evidence of State Highway Division prequalification may be submitted as evidence of financial responsibility in lieu of the certified statements or reports specified above.

20-03 Contents of proposal forms. The Owner's proposal forms state the location and description of the proposed construction; the place, date, and time of opening of the proposals; and the estimated quantities of the various items of work to be performed and materials to be furnished for which unit bid prices are asked. The proposal form states the time in which the work must be completed, and the amount of the proposal guaranty that must accompany the proposal. The Owner will accept only those Proposals properly executed on physical forms or electronic forms provided by the Owner. Bidder actions that may cause the Owner to deem a proposal irregular are given in paragraph 20-09 *Irregular proposals*.

Mobilization is limited to 10 percent of the total project cost.

A prebid conference is required on this project to discuss as a minimum, the following items: material requirements; submittals; Quality Control/Quality Assurance requirements; the construction safety and phasing plan including airport access and staging areas; and unique airfield paving construction requirements. The prebid conference location, date and time are included in the Advertisement (Notice to Bidders)

20-04 Issuance of proposal forms. The Owner reserves the right to refuse to issue a proposal form to a prospective bidder if the bidder is in default for any of the following reasons:

a. Failure to comply with any prequalification regulations of the Owner, if such regulations are cited, or otherwise included, in the proposal as a requirement for bidding.

b. Failure to pay, or satisfactorily settle, all bills due for labor and materials on former contracts in force with the Owner at the time the Owner issues the proposal to a prospective bidder.

c. Documented record of Contractor default under previous contracts with the Owner.

d. Documented record of unsatisfactory work on previous contracts with the Owner.

20-05 Interpretation of estimated proposal quantities. An estimate of quantities of work to be done and materials to be furnished under these specifications is given in the proposal. It is the result of careful calculations and is believed to be correct. It is given only as a basis for comparison of proposals and the award of the contract. The Owner does not expressly, or by implication, agree that the actual quantities involved will correspond exactly therewith; nor shall the bidder plead misunderstanding or deception because of such estimates of quantities, or of the character, location, or other conditions pertaining to the work. Payment to the Contractor will be made only for the actual quantities of work performed or materials furnished in accordance with the plans and specifications. It is understood that the quantities may be increased or decreased as provided in the Section 40, paragraph 40-02, Alteration of Work and Quantities, without in any way invalidating the unit bid prices.

20-06 Examination of plans, specifications, and site. The bidder is expected to carefully examine the site of the proposed work, the proposal, plans, specifications, and contract forms. Bidders shall satisfy themselves to the character, quality, and quantities of work to be performed, materials to be furnished, and to the requirements of the proposed contract. The submission of a proposal shall be prima facie evidence that the bidder has made such examination and is satisfied to the conditions to be encountered in performing the work and the requirements of the proposed contract, plans, and specifications.

Boring logs and other records of subsurface investigations and tests are available for inspection of bidders. It is understood and agreed that such subsurface information, whether included in the plans, specifications, or otherwise made available to the bidder, was obtained and is intended for the Owner's design and estimating purposes only. Such information has been made available for the convenience of all bidders. It is further understood and agreed that each bidder is solely responsible for all assumptions, deductions, or conclusions which the bidder may make or obtain from their own examination of the boring logs and other records of subsurface investigations and tests that are furnished by the Owner.

20-07 Preparation of proposal. The bidder shall submit their proposal on the forms furnished by the Owner. All blank spaces in the proposal forms, unless explicitly stated otherwise, must be correctly filled in where indicated for each and every item for which a quantity is given. The bidder shall state the price (written in ink or typed) both in words and numerals which they propose for each pay item furnished in the proposal. In case of conflict between words and numerals, the words, unless obviously incorrect, shall govern.

The bidder shall correctly sign the proposal in ink. If the proposal is made by an individual, their name and post office address must be shown. If made by a partnership, the name and post office address of each member of the partnership must be shown. If made by a corporation, the person signing the proposal shall give the name of the state where the corporation was chartered and the name, titles, and business address of the president, secretary, and the treasurer. Anyone signing a proposal as an agent shall file evidence of their authority to do so and that the signature is binding upon the firm or corporation.

20-08 Responsive and responsible bidder. A responsive bid conforms to all significant terms and conditions contained in the Owner's invitation for bid. It is the Owner's responsibility to decide if the exceptions taken by a bidder to the solicitation are material or not and the extent of deviation it is willing to accept.

A responsible bidder has the ability to perform successfully under the terms and conditions of a proposed procurement, as defined in 2 CFR § 200.318(h). This includes such matters as Contractor integrity, compliance with public policy, record of past performance, and financial and technical resources.

20-09 Irregular proposals. Proposals shall be considered irregular for the following reasons:

a. If the proposal is on a form other than that furnished by the Owner, or if the Owner's form is altered, or if any part of the proposal form is detached.

b. If there are unauthorized additions, conditional or alternate pay items, or irregularities of any kind that make the proposal incomplete, indefinite, or otherwise ambiguous.

c. If the proposal does not contain a unit price for each pay item listed in the proposal, except in the case of authorized alternate pay items, for which the bidder is not required to furnish a unit price.

d. If the proposal contains unit prices that are obviously unbalanced.

e. If the proposal is not accompanied by the proposal guaranty specified by the Owner.

f. If the applicable Disadvantaged Business Enterprise information is incomplete.

The Owner reserves the right to reject any irregular proposal and the right to waive technicalities if such waiver is in the best interest of the Owner and conforms to local laws and ordinances pertaining to the letting of construction contracts.

20-10 Bid guarantee. Each separate proposal shall be accompanied by a bid bond, certified check, or other specified acceptable collateral, in the amount specified in the proposal form. Such bond, check, or collateral, shall be made payable to the Owner.

20-11 Delivery of proposal. Each proposal submitted shall be placed in a sealed envelope plainly marked with the Contract Proposal, Name of Contractor, Project Title, Bid Opening date/time. When sent by mail, preferably registered, the sealed proposal, marked as indicated above, should be enclosed in an additional envelope. No proposal will be considered unless received at the place specified in the advertisement or as modified by Addendum before the time specified for opening all bids. Proposals received after the bid opening time shall be returned to the bidder unopened.

20-12 Withdrawal or revision of proposals. A bidder may withdraw or revise (by withdrawal of one proposal and submission of another) a proposal provided that the bidder's request for withdrawal is received by the Owner/Owner's Representative by email before the time specified for opening bids. Revised proposals must be received at the place specified in the advertisement before the time specified for opening all bids.

20-13 Public opening of proposals. Proposals shall be opened, and read, publicly at the time and place specified in the advertisement. Bidders, their authorized agents, and other interested persons are invited to attend. Proposals that have been withdrawn (by written or telegraphic request) or received after the time specified for opening bids shall be returned to the bidder unopened.

20-14 Disqualification of bidders. A bidder shall be considered disqualified for any of the following reasons:

a. Submitting more than one proposal from the same partnership, firm, or corporation under the same or different name.

b. Evidence of collusion among bidders. Bidders participating in such collusion shall be disqualified as bidders for any future work of the Owner until any such participating bidder has been reinstated by the Owner as a qualified bidder.

c. If the bidder is considered to be in "default" for any reason specified in paragraph 20-04, *Issuance of Proposal Forms,* of this section.

20-15 Discrepancies and Omissions. A Bidder who discovers discrepancies or omissions with the project bid documents shall immediately notify the Owner's Engineer of the matter. A bidder that has doubt as to the true meaning of a project requirement may submit to the Owner's Engineer a written request for interpretation no later than 10 days prior to bid opening.

Any interpretation of the project bid documents by the Owner's Engineer will be by written addendum issued by the Owner. The Owner will not consider any instructions, clarifications or interpretations of the bidding documents in any manner other than written addendum.

END OF SECTION 20

Section 30 Award and Execution of Contract

30-01 Consideration of proposals. After the proposals are publicly opened and read, they will be compared on the basis of the summation of the products obtained by multiplying the estimated quantities shown in the proposal by the unit bid prices. If a bidder's proposal contains a discrepancy between unit bid prices written in words and unit bid prices written in numbers, the unit bid price written in words shall govern.

Until the award of a contract is made, the Owner reserves the right to reject a bidder's proposal for any of the following reasons:

a. If the proposal is irregular as specified in Section 20, paragraph 20-09, *Irregular Proposals*.

b. If the bidder is disqualified for any of the reasons specified Section 20, paragraph 20-14, *Disqualification of Bidders*.

In addition, until the award of a contract is made, the Owner reserves the right to reject any or all proposals, waive technicalities, if such waiver is in the best interest of the Owner and is in conformance with applicable state and local laws or regulations pertaining to the letting of construction contracts; advertise for new proposals; or proceed with the work otherwise. All such actions shall promote the Owner's best interests.

30-02 Award of contract. The award of a contract, if it is to be awarded, shall be made within 90 calendar days of the date specified for publicly opening proposals, unless otherwise specified herein.

If the Owner elects to proceed with an award of contract, the Owner will make award to the responsible bidder whose bid, conforming with all the material terms and conditions of the bid documents, is the lowest in price.

30-03 Cancellation of award. The Owner reserves the right to cancel the award without liability to the bidder, except return of proposal guaranty, at any time before a contract has been fully executed by all parties and is approved by the Owner in accordance with paragraph 30-07 *Approval of Contract*.

30-04 Return of proposal guaranty. All proposal guaranties, except those of the two lowest bidders, will be returned immediately after the Owner has made a comparison of bids as specified in the paragraph 30-01, *Consideration of Proposals.* Proposal guaranties of the two lowest bidders will be retained by the Owner until such time as an award is made, at which time, the unsuccessful bidder's proposal guaranty will be returned. The successful bidder's proposal guaranty will be returned as soon as the Owner receives the contract bonds as specified in paragraph 30-05, *Requirements of Contract Bonds.*

30-05 Requirements of contract bonds. At the time of the execution of the contract, the successful bidder shall furnish the Owner a surety bond or bonds that have been fully executed by the bidder and the surety guaranteeing the performance of the work and the payment of all legal debts that may be incurred by reason of the Contractor's performance of the work. The surety and the form of the bond or bonds shall be acceptable to the Owner. Performance bond shall be in the sum equal to 125% of the full amount of the contract. Payment bond shall be in a sum equal to the full amount of the contract.

30-06 Execution of contract. The successful bidder shall sign (execute) the necessary agreements for entering into the contract and return the signed contract to the Owner, along with the fully executed surety bond or bonds specified in paragraph 30-05, *Requirements of Contract Bonds,* of this section, within 15 calendar days from the date mailed or otherwise delivered to the successful bidder.

30-07 Approval of contract. Upon receipt of the contract and contract bond or bonds that have been executed by the successful bidder, the Owner shall complete the execution of the contract in accordance with local laws or ordinances, and return the fully executed contract to the Contractor. Delivery of the

fully executed contract to the Contractor shall constitute the Owner's approval to be bound by the successful bidder's proposal and the terms of the contract**.**

30-08 Failure to execute contract. Failure of the successful bidder to execute the contract and furnish an acceptable surety bond or bonds within the period specified in paragraph 30-06, *Execution of Contract,* of this section shall be just cause for cancellation of the award and forfeiture of the proposal guaranty, not as a penalty, but as liquidated damages to the Owner.

END OF SECTION 30

Section 40 Scope of Work

40-01 Intent of contract. The intent of the contract is to provide for construction and completion, in every detail, of the work described. It is further intended that the Contractor shall furnish all labor, materials, equipment, tools, transportation, and supplies required to complete the work in accordance with the plans, specifications, and terms of the contract.

40-02 Alteration of work and quantities. The Owner reserves the right to make such changes in quantities and work as may be necessary or desirable to complete, in a satisfactory manner, the original intended work. Unless otherwise specified in the Contract, the Owner's Engineer or RPR shall be and is hereby authorized to make, in writing, such in-scope alterations in the work and variation of quantities as may be necessary to complete the work, provided such action does not represent a significant change in the character of the work.

For purpose of this section, a significant change in character of work means: any change that is outside the current contract scope of work; any change (increase or decrease) in the total contract cost by more than 25%; or any change in the total cost of a major contract item by more than 25%.

Work alterations and quantity variances that do not meet the definition of significant change in character of work shall not invalidate the contract nor release the surety. Contractor agrees to accept payment for such work alterations and quantity variances in accordance with Section 90, paragraph 90-03, *Compensation for Altered Quantities*.

Should the value of altered work or quantity variance meet the criteria for significant change in character of work, such altered work and quantity variance shall be covered by a supplemental agreement. Supplemental agreements shall also require consent of the Contractor's surety and separate performance and payment bonds. If the Owner and the Contractor are unable to agree on a unit adjustment for any contract item that requires a supplemental agreement, the Owner reserves the right to terminate the contract with respect to the item and make other arrangements for its completion.

40-03 Omitted items. The Owner, the Owner's Engineer or the RPR may provide written notice to the Contractor to omit from the work any contract item that does not meet the definition of major contract item. Major contract items may be omitted by a supplemental agreement. Such omission of contract items shall not invalidate any other contract provision or requirement.

Should a contract item be omitted or otherwise ordered to be non-performed, the Contractor shall be paid for all work performed toward completion of such item prior to the date of the order to omit such item. Payment for work performed shall be in accordance with Section 90, paragraph 90-04, *Payment for Omitted Items*.

40-04 Extra work. Should acceptable completion of the contract require the Contractor to perform an item of work not provided for in the awarded contract as previously modified by change order or supplemental agreement, Owner may issue a Change Order to cover the necessary extra work. Change orders for extra work shall contain agreed unit prices for performing the change order work in accordance with the requirements specified in the order, and shall contain any adjustment to the contract time that, in the RPR's opinion, is necessary for completion of the extra work.

When determined by the RPR to be in the Owner's best interest, the RPR may order the Contractor to proceed with extra work as provided in Section 90, paragraph 90-05, *Payment for Extra Work*. Extra work that is necessary for acceptable completion of the project, but is not within the general scope of the work covered by the original contract shall be covered by a supplemental agreement as defined in Section 10, paragraph 10-59, *Supplemental Agreement*.

If extra work is essential to maintaining the project critical path, RPR may order the Contractor to commence the extra work under a Time and Material contract method. Once sufficient detail is available to establish the level of effort necessary for the extra work, the Owner shall initiate a change order or supplemental agreement to cover the extra work.

Any claim for payment of extra work that is not covered by written agreement (change order or supplemental agreement) shall be rejected by the Owner.

40-05 Maintenance of traffic. It is the explicit intention of the contract that the safety of aircraft, as well as the Contractor's equipment and personnel, is the most important consideration. The Contractor shall maintain traffic in the manner detailed in the Construction Safety and Phasing Plan (CSPP).

a. It is understood and agreed that the Contractor shall provide for the free and unobstructed movement of aircraft in the air operations areas (AOAs) of the airport with respect to their own operations and the operations of all subcontractors as specified in Section 80, paragraph 80-04, *Limitation of Operations*. It is further understood and agreed that the Contractor shall provide for the uninterrupted operation of visual and electronic signals (including power supplies thereto) used in the guidance of aircraft while operating to, from, and upon the airport as specified in Section 70, paragraph 70-15, *Contractor's Responsibility for Utility Service and Facilities of Others*.

b. With respect to their own operations and the operations of all subcontractors, the Contractor shall provide marking, lighting, and other acceptable means of identifying personnel, equipment, vehicles, storage areas, and any work area or condition that may be hazardous to the operation of aircraft, fire-rescue equipment, or maintenance vehicles at the airport in accordance with the construction safety and phasing plan (CSPP) and the safety plan compliance document (SPCD).

c. When the contract requires the maintenance of an existing road, street, or highway during the Contractor's performance of work that is otherwise provided for in the contract, plans, and specifications, the Contractor shall keep the road, street, or highway open to all traffic and shall provide maintenance as may be required to accommodate traffic. The Contractor, at their expense, shall be responsible for the repair to equal or better than preconstruction conditions of any damage caused by the Contractor's equipment and personnel. The Contractor shall furnish, erect, and maintain barricades, warning signs, flag person, and other traffic control devices in reasonable conformity with the Manual on Uniform Traffic Control Devices (MUTCD) (http://mutcd.fhwa.dot.gov/), unless otherwise specified. The Contractor shall also construct and maintain in a safe condition any temporary connections necessary for ingress to and egress from abutting property or intersecting roads, streets or highways. Unless otherwise specified herein, the Contractor will not be required to furnish snow removal for such existing road, street, or highway.

40-06 Removal of existing structures. All existing structures encountered within the established lines, grades, or grading sections shall be removed by the Contractor, unless such existing structures are otherwise specified to be relocated, adjusted up or down, salvaged, abandoned in place, reused in the work or to remain in place. The cost of removing such existing structures shall not be measured or paid for directly, but shall be included in the various contract items.

Should the Contractor encounter an existing structure (above or below ground) in the work for which the disposition is not indicated on the plans, the Resident Project Representative (RPR) shall be notified prior to disturbing such structure. The disposition of existing structures so encountered shall be immediately determined by the RPR in accordance with the provisions of the contract.

Except as provided in Section 40, paragraph 40-07, *Rights in and Use of Materials Found in the Work*, it is intended that all existing materials or structures that may be encountered (within the lines, grades, or grading sections established for completion of the work) shall be used in the work as otherwise provided for in the contract and shall remain the property of the Owner when so used in the work.

40-07 Rights in and use of materials found in the work. Should the Contractor encounter any material such as (but not restricted to) sand, stone, gravel, slag, or concrete slabs within the established lines, grades, or grading sections, the use of which is intended by the terms of the contract to be embankment, the Contractor may at their own option either:

a. Use such material in another contract item, providing such use is approved by the RPR and is in conformance with the contract specifications applicable to such use; or,

b. Remove such material from the site, upon written approval of the RPR; or

c. Use such material for the Contractor's own temporary construction on site; or,

d. Use such material as intended by the terms of the contract.

Should the Contractor wish to exercise option a., b., or c., the Contractor shall request the RPR's approval in advance of such use.

Should the RPR approve the Contractor's request to exercise option a., b., or c., the Contractor shall be paid for the excavation or removal of such material at the applicable contract price. The Contractor shall replace, at their expense, such removed or excavated material with an agreed equal volume of material that is acceptable for use in constructing embankment, backfills, or otherwise to the extent that such replacement material is needed to complete the contract work. The Contractor shall not be charged for use of such material used in the work or removed from the site.

Should the RPR approve the Contractor's exercise of option a., the Contractor shall be paid, at the applicable contract price, for furnishing and installing such material in accordance with requirements of the contract item in which the material is used.

It is understood and agreed that the Contractor shall make no claim for delays by reason of their own exercise of option a., b., or c.

The Contractor shall not excavate, remove, or otherwise disturb any material, structure, or part of a structure which is located outside the lines, grades, or grading sections established for the work, except where such excavation or removal is provided for in the contract, plans, or specifications.

40-08 Final cleanup. Upon completion of the work and before acceptance and final payment will be made, the Contractor shall remove from the site all machinery, equipment, surplus and discarded materials, rubbish, temporary structures, and stumps or portions of trees. The Contractor shall cut all brush and woods within the limits indicated and shall leave the site in a neat and presentable condition. Material cleared from the site and deposited on adjacent property will not be considered as having been disposed of satisfactorily, unless the Contractor has obtained the written permission of the property Owner.

END OF SECTION 40

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Section 50 Control of Work

50-01 Authority of the Resident Project Representative (RPR). The RPR has final authority regarding the interpretation of project specification requirements. The RPR shall determine acceptability of the quality of materials furnished, method of performance of work performed, and the manner and rate of performance of the work. The RPR does not have the authority to accept work that does not conform to specification requirements.

50-02 Conformity with plans and specifications. All work and all materials furnished shall be in reasonably close conformity with the lines, grades, grading sections, cross-sections, dimensions, material requirements, and testing requirements that are specified (including specified tolerances) in the contract, plans, or specifications.

If the RPR finds the materials furnished, work performed, or the finished product not within reasonably close conformity with the plans and specifications, but that the portion of the work affected will, in their opinion, result in a finished product having a level of safety, economy, durability, and workmanship acceptable to the Owner, the RPR will advise the Owner of their determination that the affected work be accepted and remain in place. The RPR will document the determination and recommend to the Owner a basis of acceptance that will provide for an adjustment in the contract price for the affected portion of the work. Changes in the contract price must be covered by contract change order or supplemental agreement as applicable.

If the RPR finds the materials furnished, work performed, or the finished product are not in reasonably close conformity with the plans and specifications and have resulted in an unacceptable finished product, the affected work or materials shall be removed and replaced or otherwise corrected by and at the expense of the Contractor in accordance with the RPR's written orders.

The term "reasonably close conformity" shall not be construed as waiving the Contractor's responsibility to complete the work in accordance with the contract, plans, and specifications. The term shall not be construed as waiving the RPR's responsibility to insist on strict compliance with the requirements of the contract, plans, and specifications during the Contractor's execution of the work, when, in the RPR's opinion, such compliance is essential to provide an acceptable finished portion of the work.

The term "reasonably close conformity" is also intended to provide the RPR with the authority, after consultation with the Sponsor and FAA, to use sound engineering judgment in their determinations to accept work that is not in strict conformity, but will provide a finished product equal to or better than that required by the requirements of the contract, plans and specifications.

The RPR will not be responsible for the Contractor's means, methods, techniques, sequences, or procedures of construction or the safety precautions incident thereto.

50-03 Coordination of contract, plans, and specifications. The contract, plans, specifications, and all referenced standards cited are essential parts of the contract requirements. If electronic files are provided and used on the project and there is a conflict between the electronic files and hard copy plans, the hard copy plans shall govern. A requirement occurring in one is as binding as though occurring in all. They are intended to be complementary and to describe and provide for a complete work. In case of discrepancy, calculated dimensions will govern over scaled dimensions; contract technical specifications shall govern over contract general provisions, plans, cited standards for materials or testing, and cited advisory circulars (ACs); contract general provisions shall govern over plans, cited standards for materials or testing, and cited ACs; plans shall govern over cited standards for materials or testing and cited ACs. If any paragraphs contained in the Special Provisions conflict with General Provisions or Technical Specifications, the Special Provisions shall govern.

From time to time, discrepancies within cited testing standards occur due to the timing of the change, edits, and/or replacement of the standards. If the Contractor discovers any apparent discrepancy within standard test methods, the Contractor shall immediately ask the RPR for an interpretation and decision, and such decision shall be final.

The Contractor shall not take advantage of any apparent error or omission on the plans or specifications. In the event the Contractor discovers any apparent error or discrepancy, Contractor shall immediately notify the Owner or the designated representative in writing requesting their written interpretation and decision.

50-04 List of Special Provisions.

Special Provision 1 – Bid Protest Procedure

Special Provision 2 – Insurance Requirements

Special Provision 3 –Taxes

Special Provision 4 – Certified Payrolls

Special Provision 5 – Material Testing

50-05 Cooperation of Contractor. The Contractor shall be supplied with five hard copies or an electronic PDF of the plans and specifications. The Contractor shall have available on the construction site at all times one hardcopy each of the plans and specifications. Additional hard copies of plans and specifications may be obtained by the Contractor for the cost of reproduction.

The Contractor shall give constant attention to the work to facilitate the progress thereof, and shall cooperate with the RPR and their inspectors and with other Contractors in every way possible. The Contractor shall have a competent superintendent on the work at all times who is fully authorized as their agent on the work. The superintendent shall be capable of reading and thoroughly understanding the plans and specifications and shall receive and fulfill instructions from the RPR or their authorized representative.

50-06 Cooperation between Contractors. The Owner reserves the right to contract for and perform other or additional work on or near the work covered by this contract.

When separate contracts are let within the limits of any one project, each Contractor shall conduct the work not to interfere with or hinder the progress of completion of the work being performed by other Contractors. Contractors working on the same project shall cooperate with each other as directed.

Each Contractor involved shall assume all liability, financial or otherwise, in connection with their own contract and shall protect and hold harmless the Owner from any and all damages or claims that may arise because of inconvenience, delays, or loss experienced because of the presence and operations of other Contractors working within the limits of the same project.

The Contractor shall arrange their work and shall place and dispose of the materials being used to not interfere with the operations of the other Contractors within the limits of the same project. The Contractor shall join their work with that of the others in an acceptable manner and shall perform it in proper sequence to that of the others.

50-07 Construction layout and stakes. The Engineer/RPR shall establish necessary horizontal and vertical control. The establishment of Survey Control and/or reestablishment of survey control shall be by a State Licensed Land Surveyor. Contractor is responsible for preserving integrity of horizontal and vertical controls established by Engineer/RPR. In case of negligence on the part of the Contractor or their employees, resulting in the destruction of any horizontal and vertical control, the resulting costs will be deducted as a liquidated damage against the Contractor.

Prior to the start of construction, the Contractor will check all control points for horizontal and vertical accuracy and certify in writing to the RPR that the Contractor concurs with survey control established for the project. All lines, grades and measurements from control points necessary for the proper execution and control of the work on this project will be provided to the RPR. The Contractor is responsible to establish all layout required for the construction of the project.

Copies of survey notes will be provided to the RPR for each area of construction and for each placement of material as specified to allow the RPR to make periodic checks for conformance with plan grades, alignments and grade tolerances required by the applicable material specifications. Surveys will be provided to the RPR prior to commencing work items that cover or disturb the survey staking. Survey(s) and notes shall be provided in the following format(s): Microsoft Excel & Autocad Drawing

Laser, GPS, String line, or other automatic control shall be checked with temporary control as necessary. In the case of error, on the part of the Contractor, their surveyor, employees or subcontractors, resulting in established grades, alignment or grade tolerances that do not concur with those specified or shown on the plans, the Contractor is solely responsible for correction, removal, replacement and all associated costs at no additional cost to the Owner.

No direct payment will be made, unless otherwise specified in contract documents, for this labor, materials, or other expenses. The cost shall be included in the price of the bid for the various items of the Contract.

50-08 Authority and duties of Quality Assurance (QA) inspectors. QA inspectors shall be authorized to inspect all work done and all material furnished. Such QA inspection may extend to all or any part of the work and to the preparation, fabrication, or manufacture of the materials to be used. QA inspectors are not authorized to revoke, alter, or waive any provision of the contract. QA inspectors are not authorized to issue instructions contrary to the plans and specifications or to act as foreman for the Contractor.

QA Inspectors are authorized to notify the Contractor or their representatives of any failure of the work or materials to conform to the requirements of the contract, plans, or specifications and to reject such nonconforming materials in question until such issues can be referred to the RPR for a decision.

50-09 Inspection of the work. All materials and each part or detail of the work shall be subject to inspection. The RPR shall be allowed access to all parts of the work and shall be furnished with such information and assistance by the Contractor as is required to make a complete and detailed inspection.

If the RPR requests it, the Contractor, at any time before acceptance of the work, shall remove or uncover such portions of the finished work as may be directed. After examination, the Contractor shall restore said portions of the work to the standard required by the specifications. Should the work thus exposed or examined prove acceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be paid for as extra work; but should the work so exposed or examined prove unacceptable, the uncovering, or removing, and the replacing of the covering or making good of the parts removed will be at the Contractor’s expense.

Provide advance written notice to the RPR of work the Contractor plans to perform each week and each day. Any work done or materials used without written notice and allowing opportunity for inspection by the RPR may be ordered removed and replaced at the Contractor’s expense.

Should the contract work include relocation, adjustment, or any other modification to existing facilities, not the property of the (contract) Owner, authorized representatives of the Owners of such facilities shall have the right to inspect such work. Such inspection shall in no sense make any facility owner a party to the contract, and shall in no way interfere with the rights of the parties to this contract.

50-10 Removal of unacceptable and unauthorized work. All work that does not conform to the requirements of the contract, plans, and specifications will be considered unacceptable, unless otherwise

determined acceptable by the RPR as provided in paragraph 50-02, *Conformity with Plans and Specifications*.

Unacceptable work, whether the result of poor workmanship, use of defective materials, damage through carelessness, or any other cause found to exist prior to the final acceptance of the work, shall be removed immediately and replaced in an acceptable manner in accordance with the provisions of Section 70, paragraph 70-14, *Contractor's Responsibility for Work*.

No removal work made under provision of this paragraph shall be done without lines and grades having been established by the RPR. Work done contrary to the instructions of the RPR, work done beyond the lines shown on the plans or as established by the RPR, except as herein specified, or any extra work done without authority, will be considered as unauthorized and will not be paid for under the provisions of the contract. Work so done may be ordered removed or replaced at the Contractor's expense.

Upon failure on the part of the Contractor to comply with any order of the RPR made under the provisions of this subsection, the RPR will have authority to cause unacceptable work to be remedied or removed and replaced; and unauthorized work to be removed and recover the resulting costs as a liquidated damage against the Contractor.

50-11 Load restrictions. The Contractor shall comply with all legal load restrictions in the hauling of materials on public roads beyond the limits of the work. A special permit will not relieve the Contractor of liability for damage that may result from the moving of material or equipment.

The operation of equipment of such weight or so loaded as to cause damage to structures or to any other type of construction will not be permitted. Hauling of materials over the base course or surface course under construction shall be limited as directed. No loads will be permitted on a concrete pavement, base, or structure before the expiration of the curing period. The Contractor, at their own expense, shall be responsible for the repair to equal or better than preconstruction conditions of any damage caused by the Contractor's equipment and personnel.

50-12 Maintenance during construction. The Contractor shall maintain the work during construction and until the work is accepted. Maintenance shall constitute continuous and effective work prosecuted day by day, with adequate equipment and forces so that the work is maintained in satisfactory condition at all times.

In the case of a contract for the placing of a course upon a course or subgrade previously constructed, the Contractor shall maintain the previous course or subgrade during all construction operations.

All costs of maintenance work during construction and before the project is accepted shall be included in the unit prices bid on the various contract items, and the Contractor will not be paid an additional amount for such work.

50-13 Failure to maintain the work. Should the Contractor at any time fail to maintain the work as provided in paragraph 50-12, *Maintenance during Construction*, the RPR shall immediately notify the Contractor of such noncompliance. Such notification shall specify a reasonable time within which the Contractor shall be required to remedy such unsatisfactory maintenance condition. The time specified will give due consideration to the exigency that exists.

Should the Contractor fail to respond to the RPR's notification, the Owner may suspend any work necessary for the Owner to correct such unsatisfactory maintenance condition, depending on the exigency that exists. Any maintenance cost incurred by the Owner, shall be recovered as a liquidated damage against the Contractor.

50-14 Partial acceptance. If at any time during the execution of the project the Contractor substantially completes a usable unit or portion of the work, the occupancy of which will benefit the Owner, the Contractor may request the RPR to make final inspection of that unit. If the RPR finds upon inspection

that the unit has been satisfactorily completed in compliance with the contract, the RPR may accept it as being complete, and the Contractor may be relieved of further responsibility for that unit. Such partial acceptance and beneficial occupancy by the Owner shall not void or alter any provision of the contract.

50-15 Final acceptance. Upon due notice from the Contractor of presumptive completion of the entire project, the RPR and Owner will make an inspection. If all construction provided for and contemplated by the contract is found to be complete in accordance with the contract, plans, and specifications, such inspection shall constitute the final inspection. The RPR shall notify the Contractor in writing of final acceptance as of the date of the final inspection.

If, however, the inspection discloses any work, in whole or in part, as being unsatisfactory, the RPR will notify the Contractor and the Contractor shall correct the unsatisfactory work. Upon correction of the work, another inspection will be made which shall constitute the final inspection, provided the work has been satisfactorily completed. In such event, the RPR will make the final acceptance and notify the Contractor in writing of this acceptance as of the date of final inspection.

50-16 Claims for adjustment and disputes. If for any reason the Contractor deems that additional compensation is due for work or materials not clearly provided for in the contract, plans, or specifications or previously authorized as extra work, the Contractor shall notify the RPR in writing of their intention to claim such additional compensation before the Contractor begins the work on which the Contractor bases the claim. If such notification is not given or the RPR is not afforded proper opportunity by the Contractor for keeping strict account of actual cost as required, then the Contractor hereby agrees to waive any claim for such additional compensation. Such notice by the Contractor and the fact that the RPR has kept account of the cost of the work shall not in any way be construed as proving or substantiating the validity of the claim. When the work on which the claim for additional compensation is based has been completed, the Contractor shall, within 10 calendar days, submit a written claim to the RPR who will present it to the Owner for consideration in accordance with local laws or ordinances.

Nothing in this subsection shall be construed as a waiver of the Contractor’s right to dispute final payment based on differences in measurements or computations.

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Section 60 Control of Materials

60-01 Source of supply and quality requirements. The materials used in the work shall conform to the requirements of the contract, plans, and specifications. Unless otherwise specified, such materials that are manufactured or processed shall be new (as compared to used or reprocessed).

In order to expedite the inspection and testing of materials, the Contractor shall furnish documentation to the RPR as to the origin, composition, and manufacture of all materials to be used in the work. Documentation shall be furnished promptly after execution of the contract but, in all cases, prior to delivery of such materials.

At the RPR's option, materials may be approved at the source of supply before delivery. If it is found after trial that sources of supply for previously approved materials do not produce specified products, the Contractor shall furnish materials from other sources.

The Contractor shall furnish airport lighting equipment that meets the requirements of the specifications; and is listed in AC 150/5345-53, *Airport Lighting Equipment Certification Program* and *Addendum*, that is in effect on the date of advertisement.

60-02 Samples, tests, and cited specifications. All materials used in the work shall be inspected, tested, and approved by the RPR before incorporation in the work unless otherwise designated. Any work in which untested materials are used without approval or written permission of the RPR shall be performed at the Contractor's risk. Materials found to be unacceptable and unauthorized will not be paid for and, if directed by the RPR, shall be removed at the Contractor's expense.

Unless otherwise designated, quality assurance tests will be made by and at the expense of the Owner in accordance with the cited standard methods of ASTM, American Association of State Highway and Transportation Officials (AASHTO), federal specifications, Commercial Item Descriptions, and all other cited methods, which are current on the date of advertisement for bids.

The testing organizations performing on-site quality assurance field tests shall have copies of all referenced standards on the construction site for use by all technicians and other personnel. Unless otherwise designated, samples for quality assurance will be taken by a qualified representative of the RPR. All materials being used are subject to inspection, test, or rejection at any time prior to or during incorporation into the work. Copies of all tests will be furnished to the Contractor's representative at their request after review and approval of the RPR.

A copy of all Contractor QC test data shall be provided to the RPR daily, along with printed reports, in an approved format, on a weekly basis. After completion of the project, and prior to final payment, the Contractor shall submit a final report to the RPR showing all test data reports, plus an analysis of all results showing ranges, averages, and corrective action taken on all failing tests.

The Contractor shall employ a Quality Control (QC) testing organization to perform all Contractor required QC tests in accordance with Item C-100 Contractor Quality Control Program (CQCP).

60-03 Certification of compliance/analysis (COC/COA). The RPR may permit the use, prior to sampling and testing, of certain materials or assemblies when accompanied by manufacturer's COC stating that such materials or assemblies fully comply with the requirements of the contract. The certificate shall be signed by the manufacturer. Each lot of such materials or assemblies delivered to the work must be accompanied by a certificate of compliance in which the lot is clearly identified. The COA is the manufacturer's COC and includes all applicable test results.

Materials or assemblies used on the basis of certificates of compliance may be sampled and tested at any time and if found not to be in conformity with contract requirements will be subject to rejection whether in place or not.

The form and distribution of certificates of compliance shall be as approved by the RPR.

When a material or assembly is specified by "brand name or equal" and the Contractor elects to furnish the specified "or equal," the Contractor shall be required to furnish the manufacturer's certificate of compliance for each lot of such material or assembly delivered to the work. Such certificate of compliance shall clearly identify each lot delivered and shall certify as to:

a. Conformance to the specified performance, testing, quality or dimensional requirements; and,

b. Suitability of the material or assembly for the use intended in the contract work.

The RPR shall be the sole judge as to whether the proposed "or equal" is suitable for use in the work.

The RPR reserves the right to refuse permission for use of materials or assemblies on the basis of certificates of compliance.

60-04 Plant inspection. The RPR or their authorized representative may inspect, at its source, any specified material or assembly to be used in the work. Manufacturing plants may be inspected from time to time for the purpose of determining compliance with specified manufacturing methods or materials to be used in the work and to obtain samples required for acceptance of the material or assembly.

Should the RPR conduct plant inspections, the following conditions shall exist:

a. The RPR shall have the cooperation and assistance of the Contractor and the producer with whom the Contractor has contracted for materials.

b. The RPR shall have full entry at all reasonable times to such parts of the plant that concern the manufacture or production of the materials being furnished.

c. If required by the RPR, the Contractor shall arrange for adequate office or working space that may be reasonably needed for conducting plant inspections. Place office or working space in a convenient location with respect to the plant.

It is understood and agreed that the Owner shall have the right to retest any material that has been tested and approved at the source of supply after it has been delivered to the site. The RPR shall have the right to reject only material which, when retested, does not meet the requirements of the contract, plans, or specifications.

60-05 Engineer/ Resident Project Representative (RPR) field office. The Contractor shall provide dedicated space for the use of the engineer, RPR, and inspectors, as a field office for the duration of the project. This space shall be located conveniently near the construction and shall be separate from any space used by the Contractor. The Contractor shall furnish water, sanitary facilities, heat, air conditioning, and electricity.

60-06 Storage of materials. Materials shall be stored to assure the preservation of their quality and fitness for the work. Stored materials, even though approved before storage, may again be inspected prior to their use in the work. Stored materials shall be located to facilitate their prompt inspection. The Contractor shall coordinate the storage of all materials with the RPR. Materials to be stored on airport property shall not create an obstruction to air navigation nor shall they interfere with the free and unobstructed movement of aircraft. Unless otherwise shown on the plans and/or CSPP, the storage of materials and the location of the Contractor's plant and parked equipment or vehicles shall be as directed by the RPR. Private property shall not be used for storage purposes without written permission of the Owner or lessee of such property. The Contractor shall make all arrangements and bear all expenses for

the storage of materials on private property. Upon request, the Contractor shall furnish the RPR a copy of the property Owner's permission.

All storage sites on private or airport property shall be restored to their original condition by the Contractor at their expense, except as otherwise agreed to (in writing) by the Owner or lessee of the property.

60-07 Unacceptable materials. Any material or assembly that does not conform to the requirements of the contract, plans, or specifications shall be considered unacceptable and shall be rejected. The Contractor shall remove any rejected material or assembly from the site of the work, unless otherwise instructed by the RPR.

Rejected material or assembly, the defects of which have been corrected by the Contractor, shall not be returned to the site of the work until such time as the RPR has approved its use in the work.

60-08 Owner furnished materials. The Contractor shall furnish all materials required to complete the work, except those specified, if any, to be furnished by the Owner. Owner-furnished materials shall be made available to the Contractor at the location specified.

All costs of handling, transportation from the specified location to the site of work, storage, and installing Owner-furnished materials shall be included in the unit price bid for the contract item in which such Owner-furnished material is used.

After any Owner-furnished material has been delivered to the location specified, the Contractor shall be responsible for any demurrage, damage, loss, or other deficiencies that may occur during the Contractor's handling, storage, or use of such Owner-furnished material. The Owner will deduct from any monies due or to become due the Contractor any cost incurred by the Owner in making good such loss due to the Contractor's handling, storage, or use of Owner-furnished materials.

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Section 70 Legal Regulations and Responsibility to Public

70-01 Laws to be observed. The Contractor shall keep fully informed of all federal and state laws, all local laws, ordinances, and regulations and all orders and decrees of bodies or tribunals having any jurisdiction or authority, which in any manner affect those engaged or employed on the work, or which in any way affect the conduct of the work. The Contractor shall at all times observe and comply with all such laws, ordinances, regulations, orders, and decrees; and shall protect and indemnify the Owner and all their officers, agents, or servants against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree, whether by the Contractor or the Contractor's employees.

70-02 Permits, licenses, and taxes. The Contractor shall procure all permits and licenses, pay all charges, fees, and taxes, and give all notices necessary and incidental to the due and lawful execution of the work.

70-03 Patented devices, materials, and processes. If the Contractor is required or desires to use any design, device, material, or process covered by letters of patent or copyright, the Contractor shall provide for such use by suitable legal agreement with the Patentee or Owner. The Contractor and the surety shall indemnify and hold harmless the Owner, any third party, or political subdivision from any and all claims for infringement by reason of the use of any such patented design, device, material or process, or any trademark or copyright, and shall indemnify the Owner for any costs, expenses, and damages which it may be obliged to pay by reason of an infringement, at any time during the execution or after the completion of the work.

70-04 Restoration of surfaces disturbed by others. The Owner reserves the right to authorize the construction, reconstruction, or maintenance of any public or private utility service, FAA or National Oceanic and Atmospheric Administration (NOAA) facility, or a utility service of another government agency at any time during the progress of the work. To the extent that such construction, reconstruction, or maintenance has been coordinated with the Owner, such authorized work (by others) must be shown on the plans and is indicated as follows:

Communication – AT&T

Sanitary Sewer – City of South Bend

Water – City of South Bend

Communication/Cable – Comcast

Power – AEP

FAA NAVAids – FAA Tech Ops

Except as listed above, the Contractor shall not permit any individual, firm, or corporation to excavate or otherwise disturb such utility services or facilities located within the limits of the work without the written permission of the RPR.

Should the Owner of public or private utility service, FAA, or NOAA facility, or a utility service of another government agency be authorized to construct, reconstruct, or maintain such utility service or facility during the progress of the work, the Contractor shall cooperate with such Owners by arranging and performing the work in this contract to facilitate such construction, reconstruction or maintenance by others whether or not such work by others is listed above. When ordered as extra work by the RPR, the Contractor shall make all necessary repairs to the work which are due to such authorized work by others, unless otherwise provided for in the contract, plans, or specifications. It is understood and agreed that the Contractor shall not be entitled to make any claim for damages due to such authorized work by others or for any delay to the work resulting from such authorized work.

70-05 Federal Participation. The United States Government has agreed to reimburse the Owner for some portion of the contract costs. The contract work is subject to the inspection and approval of duly authorized representatives of the FAA Administrator. No requirement of this contract shall be construed as making the United States a party to the contract nor will any such requirement interfere, in any way, with the rights of either party to the contract.

70-06 Sanitary, health, and safety provisions. The Contractor's worksite and facilities shall comply with applicable federal, state, and local requirements for health, safety and sanitary provisions.

70-07 Public convenience and safety. The Contractor shall control their operations and those of their subcontractors and all suppliers, to assure the least inconvenience to the traveling public. Under all circumstances, safety shall be the most important consideration.

The Contractor shall maintain the free and unobstructed movement of aircraft and vehicular traffic with respect to their own operations and those of their own subcontractors and all suppliers in accordance with Section 40, paragraph 40-05, *Maintenance of Traffic,* and shall limit such operations for the convenience and safety of the traveling public as specified in Section 80, paragraph 80-04, *Limitation of Operations*.

The Contractor shall remove or control debris and rubbish resulting from its work operations at frequent intervals, and upon the order of the RPR. If the RPR determines the existence of Contractor debris in the work site represents a hazard to airport operations and the Contractor is unable to respond in a prompt and reasonable manner, the RPR reserves the right to assign the task of debris removal to a third party and recover the resulting costs as a liquidated damage against the Contractor.

70-08 Construction Safety and Phasing Plan (CSPP). The Contractor shall complete the work in accordance with the approved Construction Safety and Phasing Plan (CSPP) developed in accordance with AC 150/5370-2, Operational Safety on Airports During Construction. The CSPP is on sheet(s) G-081 to G-085 of the project plans.

70-09 Use of explosives. The use of explosives is not permitted on this project.

70-10 Protection and restoration of property and landscape. The Contractor shall be responsible for the preservation of all public and private property, and shall protect carefully from disturbance or damage all land monuments and property markers until the Engineer/RPR has witnessed or otherwise referenced their location and shall not move them until directed.

The Contractor shall be responsible for all damage or injury to property of any character, during the execution of the work, resulting from any act, omission, neglect, or misconduct in manner or method of executing the work, or at any time due to defective work or materials, and said responsibility shall not be released until the project has been completed and accepted.

When or where any direct or indirect damage or injury is done to public or private property by or on account of any act, omission, neglect, or misconduct in the execution of the work, or in consequence of the non-execution thereof by the Contractor, the Contractor shall restore, at their expense, such property to a condition similar or equal to that existing before such damage or injury was done, by repairing, or otherwise restoring as may be directed, or the Contractor shall make good such damage or injury in an acceptable manner.

70-11 Responsibility for damage claims. The Contractor shall indemnify and hold harmless the Engineer/RPR and the Owner and their officers, agents, and employees from all suits, actions, or claims, of any character, brought because of any injuries or damage received or sustained by any person, persons, or property on account of the operations of the Contractor; or on account of or in consequence of any neglect in safeguarding the work; or through use of unacceptable materials in constructing the work; or because of any act or omission, neglect, or misconduct of said Contractor; or because of any claims or amounts recovered from any infringements of patent, trademark, or copyright; or from any claims or amounts arising or recovered under the "Workmen's Compensation Act," or any other law, ordinance,

order, or decree. Money due the Contractor under and by virtue of their own contract considered necessary by the Owner for such purpose may be retained for the use of the Owner or, in case no money is due, their own surety may be held until such suits, actions, or claims for injuries or damages shall have been settled and suitable evidence to that effect furnished to the Owner, except that money due the Contractor will not be withheld when the Contractor produces satisfactory evidence that he or she is adequately protected by public liability and property damage insurance.

70-12 Third party beneficiary clause. It is specifically agreed between the parties executing the contract that it is not intended by any of the provisions of any part of the contract to create for the public or any member thereof, a third-party beneficiary or to authorize anyone not a party to the contract to maintain a suit for personal injuries or property damage pursuant to the terms or provisions of the contract.

70-13 Opening sections of the work to traffic. If it is necessary for the Contractor to complete portions of the contract work for the beneficial occupancy of the Owner prior to completion of the entire contract, such "phasing" of the work must be specified below or indicated on the approved Construction Safety and Phasing Plan (CSPP) and the project plans. When so specified, the Contractor shall complete such portions of the work on or before the date specified or as otherwise specified.

Upon completion of any portion of work listed above, such portion shall be accepted by the Owner in accordance with Section 50, paragraph 50-14, *Partial Acceptance*.

No portion of the work may be opened by the Contractor until directed by the Owner in writing. Should it become necessary to open a portion of the work to traffic on a temporary or intermittent basis, such openings shall be made when, in the opinion of the RPR, such portion of the work is in an acceptable condition to support the intended traffic. Temporary or intermittent openings are considered to be inherent in the work and shall not constitute either acceptance of the portion of the work so opened or a waiver of any provision of the contract. Any damage to the portion of the work so opened that is not attributable to traffic which is permitted by the Owner shall be repaired by the Contractor at their expense.

The Contractor shall make their own estimate of the inherent difficulties involved in completing the work under the conditions herein described and shall not claim any added compensation by reason of delay or increased cost due to opening a portion of the contract work.

The Contractor must conform to safety standards contained AC 150/5370-2 and the approved CSPP.

Contractor shall refer to the plans, specifications, and the approved CSPP to identify barricade requirements, temporary and/or permanent markings, airfield lighting, guidance signs and other safety requirements prior to opening up sections of work to traffic.

70-14 Contractor's responsibility for work. Until the RPR's final written acceptance of the entire completed work, excepting only those portions of the work accepted in accordance with Section 50, paragraph 50-14, *Partial Acceptance*, the Contractor shall have the charge and care thereof and shall take every precaution against injury or damage to any part due to the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the work. The Contractor shall rebuild, repair, restore, and make good all injuries or damages to any portion of the work occasioned by any of the above causes before final acceptance and shall bear the expense thereof except damage to the work due to unforeseeable causes beyond the control of and without the fault or negligence of the Contractor, including but not restricted to acts of God such as earthquake, tidal wave, tornado, hurricane or other cataclysmic phenomenon of nature, or acts of the public enemy or of government authorities.

If the work is suspended for any cause whatever, the Contractor shall be responsible for the work and shall take such precautions necessary to prevent damage to the work. The Contractor shall provide for normal drainage and shall erect necessary temporary structures, signs, or other facilities at their own expense. During such period of suspension of work, the Contractor shall properly and continuously maintain in an acceptable growing condition all living material in newly established planting, seeding,

and sodding furnished under the contract, and shall take adequate precautions to protect new tree growth and other important vegetative growth against injury.

70-15 Contractor's responsibility for utility service and facilities of others. As provided in paragraph 70-04, *Restoration of Surfaces Disturbed by Others*, the Contractor shall cooperate with the owner of any public or private utility service, FAA or NOAA, or a utility service of another government agency that may be authorized by the Owner to construct, reconstruct or maintain such utility services or facilities during the progress of the work. In addition, the Contractor shall control their operations to prevent the unscheduled interruption of such utility services and facilities.

To the extent that such public or private utility services, FAA, or NOAA facilities, or utility services of another governmental agency are known to exist within the limits of the contract work, the approximate locations have been indicated on the plans and/or in the contract documents.

It is understood and agreed that the Owner does not guarantee the accuracy or the completeness of the location information relating to existing utility services, facilities, or structures that may be shown on the plans or encountered in the work. Any inaccuracy or omission in such information shall not relieve the Contractor of the responsibility to protect such existing features from damage or unscheduled interruption of service.

It is further understood and agreed that the Contractor shall, upon execution of the contract, notify the Owners of all utility services or other facilities of their plan of operations. Such notification shall be in writing addressed to "The Person to Contact" as provided in this paragraph and paragraph 70-04, *Restoration of Surfaces Disturbed By Others*. A copy of each notification shall be given to the RPR.

In addition to the general written notification provided, it shall be the responsibility of the Contractor to keep such individual Owners advised of changes in their plan of operations that would affect such Owners.

Prior to beginning the work in the general vicinity of an existing utility service or facility, the Contractor shall again notify each such Owner of their plan of operation. If, in the Contractor's opinion, the Owner's assistance is needed to locate the utility service or facility or the presence of a representative of the Owner is desirable to observe the work, such advice should be included in the notification. Such notification shall be given by the most expeditious means to reach the utility owner's "Person to Contact" no later than two normal business days prior to the Contractor's commencement of operations in such general vicinity. The Contractor shall furnish a written summary of the notification to the RPR.

The Contractor's failure to give the two days' notice shall be cause for the Owner to suspend the Contractor's operations in the general vicinity of a utility service or facility.

Where the outside limits of an underground utility service have been located and staked on the ground, the Contractor shall be required to use hand excavation methods within 3 feet (1 m) of such outside limits at such points as may be required to ensure protection from damage due to the Contractor's operations.

Should the Contractor damage or interrupt the operation of a utility service or facility by accident or otherwise, the Contractor shall immediately notify the proper authority and the RPR and shall take all reasonable measures to prevent further damage or interruption of service. The Contractor, in such events, shall cooperate with the utility service or facility owner and the RPR continuously until such damage has been repaired and service restored to the satisfaction of the utility or facility owner.

The Contractor shall bear all costs of damage and restoration of service to any utility service or facility due to their operations whether due to negligence or accident. The Owner reserves the right to deduct such costs from any monies due or which may become due the Contractor, or their own surety.

70-15.1 FAA facilities and cable runs. The Contractor is hereby advised that the construction limits of the project include existing facilities and buried cable runs that are owned, operated and maintained by the FAA. The Contractor, during the execution of the project work, shall comply with the following:

a. The Contractor shall permit FAA maintenance personnel the right of access to the project work site for purposes of inspecting and maintaining all existing FAA owned facilities.

b. The Contractor shall provide notice to the FAA Air Traffic Organization (ATO)/Technical Operations/System Support Center (SSC) Point-of-Contact through the airport Owner a minimum of seven (7) calendar days prior to commencement of construction activities in order to permit sufficient time to locate and mark existing buried cables and to schedule any required facility outages.

c. If execution of the project work requires a facility outage, the Contractor shall contact the FAA Point-of-Contact a minimum of 72 hours prior to the time of the required outage.

d. Any damage to FAA cables, access roads, or FAA facilities during construction caused by the Contractor's equipment or personnel whether by negligence or accident will require the Contractor to repair or replace the damaged cables, access road, or FAA facilities to FAA requirements. The Contractor shall not bear the cost to repair damage to underground facilities or utilities improperly located by the FAA.

e. If the project work requires the cutting or splicing of FAA owned cables, the FAA Point-of-Contact shall be contacted a minimum of 72 hours prior to the time the cable work commences. The FAA reserves the right to have a FAA representative on site to observe the splicing of the cables as a condition of acceptance. All cable splices are to be accomplished in accordance with FAA specifications and require approval by the FAA Point-of-Contact as a condition of acceptance by the Owner. The Contractor is hereby advised that FAA restricts the location of where splices may be installed. If a cable splice is required in a location that is not permitted by FAA, the Contractor shall furnish and install a sufficient length of new cable that eliminates the need for any splice.

70-16 Furnishing rights-of-way. The Owner will be responsible for furnishing all rights-of-way upon which the work is to be constructed in advance of the Contractor's operations.

70-17 Personal liability of public officials. In carrying out any of the contract provisions or in exercising any power or authority granted by this contract, there shall be no liability upon the Engineer, RPR, their authorized representatives, or any officials of the Owner either personally or as an official of the Owner. It is understood that in such matters they act solely as agents and representatives of the Owner.

70-18 No waiver of legal rights. Upon completion of the work, the Owner will expeditiously make final inspection and notify the Contractor of final acceptance. Such final acceptance, however, shall not preclude or stop the Owner from correcting any measurement, estimate, or certificate made before or after completion of the work, nor shall the Owner be precluded or stopped from recovering from the Contractor or their surety, or both, such overpayment as may be sustained, or by failure on the part of the Contractor to fulfill their obligations under the contract. A waiver on the part of the Owner of any breach of any part of the contract shall not be held to be a waiver of any other or subsequent breach.

The Contractor, without prejudice to the terms of the contract, shall be liable to the Owner for latent defects, fraud, or such gross mistakes as may amount to fraud, or as regards the Owner's rights under any warranty or guaranty.

70-19 Environmental protection. The Contractor shall comply with all federal, state, and local laws and regulations controlling pollution of the environment. The Contractor shall take necessary precautions to prevent pollution of streams, lakes, ponds, and reservoirs with fuels, oils, asphalts, chemicals, or other harmful materials and to prevent pollution of the atmosphere from particulate and gaseous matter.

70-20 Archaeological and historical findings. Unless otherwise specified in this subsection, the Contractor is advised that the site of the work is not within any property, district, or site, and does not contain any building, structure, or object listed in the current National Register of Historic Places published by the United States Department of Interior.

Should the Contractor encounter, during their operations, any building, part of a building, structure, or object that is incongruous with its surroundings, the Contractor shall immediately cease operations in that location and notify the RPR. The RPR will immediately investigate the Contractor's finding and the Owner will direct the Contractor to either resume operations or to suspend operations as directed.

Should the Owner order suspension of the Contractor's operations in order to protect an archaeological or historical finding, or order the Contractor to perform extra work, such shall be covered by an appropriate contract change order or supplemental agreement as provided in Section 40, paragraph 40-04, *Extra Work,* and Section 90, paragraph 90-05, *Payment for Extra Work*. If appropriate, the contract change order or supplemental agreement shall include an extension of contract time in accordance with Section 80, paragraph 80-07, *Determination and Extension of Contract Time*.

70-21 Insurance Requirements. Insurance requirements are included as Special Provision 2

END OF SECTION 70

Section 80 Execution and Progress

80-01 Subletting of contract. The Owner will not recognize any subcontractor on the work. The Contractor shall at all times when work is in progress be represented either in person, by a qualified superintendent, or by other designated, qualified representative who is duly authorized to receive and execute orders of the Resident Project Representative (RPR).

The Contractor shall perform, with his organization, an amount of work equal to at least 40 percent of the total contract cost.

Should the Contractor elect to assign their contract, said assignment shall be concurred in by the surety, shall be presented for the consideration and approval of the Owner, and shall be consummated only on the written approval of the Owner.

The Contractor shall provide copies of all subcontracts to the RPR 14 days prior to being utilized on the project. As a minimum, the information shall include the following:

- Subcontractor's legal company name.
- Subcontractor's legal company address, including County name.
- Principal contact person's name, telephone and fax number.
- Complete narrative description, and dollar value of the work to be performed by the subcontractor.
- Copies of required insurance certificates in accordance with the specifications.
- Minority/ non-minority status.

80-02 Notice to proceed (NTP). The Owners notice to proceed will state the date on which contract time commences. The Contractor is expected to commence project operations within 10 days of the NTP date. The Contractor shall notify the RPR at least 24 hours in advance of the time contract operations begins. The Contractor shall not commence any actual operations prior to the date on which the notice to proceed is issued by the Owner.

80-03 Execution and progress. Unless otherwise specified, the Contractor shall submit their coordinated construction schedule showing all work activities for the RPR's review and acceptance at least 10 days prior to the start of work. The Contractor's progress schedule, once accepted by the RPR, will represent the Contractor's baseline plan to accomplish the project in accordance with the terms and conditions of the Contract. The RPR will compare actual Contractor progress against the baseline schedule to determine that status of the Contractor's performance. The Contractor shall provide sufficient materials, equipment, and labor to guarantee the completion of the project in accordance with the plans and specifications within the time set forth in the proposal.

If the Contractor falls significantly behind the submitted schedule, the Contractor shall, upon the RPR's request, submit a revised schedule for completion of the work within the contract time and modify their operations to provide such additional materials, equipment, and labor necessary to meet the revised schedule. Should the execution of the work be discontinued for any reason, the Contractor shall notify the RPR at least 24 hours in advance of resuming operations.

The Contractor shall not commence any actual construction prior to the date on which the NTP is issued by the Owner.

The project schedule shall be prepared as a network diagram in Critical Path Method (CPM), Program Evaluation and Review Technique (PERT), or other format, or as otherwise specified. It shall include

information on the sequence of work activities, milestone dates, and activity duration. The schedule shall show all work items identified in the project proposal for each work area and shall include the project start date and end date.

The Contractor shall maintain the work schedule and provide an update and analysis of the progress schedule on a twice monthly basis, or as otherwise specified in the contract. Submission of the work schedule shall not relieve the Contractor of overall responsibility for scheduling, sequencing, and coordinating all work to comply with the requirements of the contract.

80-04 Limitation of operations. The Contractor shall control their operations and the operations of their subcontractors and all suppliers to provide for the free and unobstructed movement of aircraft in the air operations areas (AOA) of the airport.

When the work requires the Contractor to conduct their operations within an AOA of the airport, the work shall be coordinated with airport operations (through the RPR) at least 72 hours prior to commencement of such work. The Contractor shall not close an AOA until so authorized by the RPR and until the necessary temporary marking, signage and associated lighting is in place as provided in Section 70, paragraph 70-08, *Construction Safety and Phasing Plan (CSPP)*.

When the contract work requires the Contractor to work within an AOA of the airport on an intermittent basis (intermittent opening and closing of the AOA), the Contractor shall maintain constant communications as specified; immediately obey all instructions to vacate the AOA; and immediately obey all instructions to resume work in such AOA. Failure to maintain the specified communications or to obey instructions shall be cause for suspension of the Contractor's operations in the AOA until satisfactory conditions are provided. The areas of the AOA identified in the Construction Safety Phasing Plan (CSPP) or as listed below, cannot be closed to operating aircraft to permit the Contractor's operations on a continuous basis and will therefore be closed to aircraft operations intermittently as follows

The Contractor shall be required to conform to safety standards contained in AC 150/5370-2, Operational Safety on Airports During Construction and the approved CSPP.

80-04.1 Operational safety on airport during construction. All Contractors' operations shall be conducted in accordance with the approved project Construction Safety and Phasing Plan (CSPP) and the Safety Plan Compliance Document (SPCD) and the provisions set forth within the current version of AC 150/5370-2, Operational Safety on Airports During Construction. The CSPP included within the contract documents conveys minimum requirements for operational safety on the airport during construction activities. The Contractor shall prepare and submit a SPCD that details how it proposes to comply with the requirements presented within the CSPP.

The Contractor shall implement all necessary safety plan measures prior to commencement of any work activity. The Contractor shall conduct routine checks to assure compliance with the safety plan measures.

The Contractor is responsible to the Owner for the conduct of all subcontractors it employs on the project. The Contractor shall assure that all subcontractors are made aware of the requirements of the CSPP and SPCD and that they implement and maintain all necessary measures.

No deviation or modifications may be made to the approved CSPP and SPCD unless approved in writing by the Owner. The necessary coordination actions to review Contractor proposed modifications to an approved CSPP or approved SPCD can require a significant amount of time.

80-05 Character of workers, methods, and equipment. The Contractor shall, at all times, employ sufficient labor and equipment for prosecuting the work to full completion in the manner and time required by the contract, plans, and specifications.

All workers shall have sufficient skill and experience to perform properly the work assigned to them. Workers engaged in special work or skilled work shall have sufficient experience in such work and in the operation of the equipment required to perform the work satisfactorily.

Any person employed by the Contractor or by any subcontractor who violates any operational regulations or operational safety requirements and, in the opinion of the RPR, does not perform his work in a proper and skillful manner or is intemperate or disorderly shall, at the written request of the RPR, be removed immediately by the Contractor or subcontractor employing such person, and shall not be employed again in any portion of the work without approval of the RPR.

Should the Contractor fail to remove such person or persons, or fail to furnish suitable and sufficient personnel for the proper execution of the work, the RPR may suspend the work by written notice until compliance with such orders.

All equipment that is proposed to be used on the work shall be of sufficient size and in such mechanical condition as to meet requirements of the work and to produce a satisfactory quality of work. Equipment used on any portion of the work shall not cause injury to previously completed work, adjacent property, or existing airport facilities due to its use.

When the methods and equipment to be used by the Contractor in accomplishing the work are not prescribed in the contract, the Contractor is free to use any methods or equipment that will accomplish the work in conformity with the requirements of the contract, plans, and specifications.

When the contract specifies the use of certain methods and equipment, such methods and equipment shall be used unless otherwise authorized by the RPR. If the Contractor desires to use a method or type of equipment other than specified in the contract, the Contractor may request authority from the RPR to do so. The request shall be in writing and shall include a full description of the methods and equipment proposed and of the reasons for desiring to make the change. If approval is given, it will be on the condition that the Contractor will be fully responsible for producing work in conformity with contract requirements. If, after trial use of the substituted methods or equipment, the RPR determines that the work produced does not meet contract requirements, the Contractor shall discontinue the use of the substitute method or equipment and shall complete the remaining work with the specified methods and equipment. The Contractor shall remove any deficient work and replace it with work of specified quality, or take such other corrective action as the RPR may direct. No change will be made in basis of payment for the contract items involved nor in contract time as a result of authorizing a change in methods or equipment under this paragraph.

80-06 Temporary suspension of the work. The Owner shall have the authority to suspend the work wholly, or in part, for such period or periods the Owner may deem necessary, due to unsuitable weather, or other conditions considered unfavorable for the execution of the work, or for such time necessary due to the failure on the part of the Contractor to carry out orders given or perform any or all provisions of the contract.

In the event that the Contractor is ordered by the Owner, in writing, to suspend work for some unforeseen cause not otherwise provided for in the contract and over which the Contractor has no control, the Contractor may be reimbursed for actual money expended on the work during the period of shutdown. No allowance will be made for anticipated profits. The period of shutdown shall be computed from the effective date of the written order to suspend work to the effective date of the written order to resume the work. Claims for such compensation shall be filed with the RPR within the time period stated in the RPR's order to resume work. The Contractor shall submit with their own claim information substantiating the amount shown on the claim. The RPR will forward the Contractor's claim to the Owner for consideration in accordance with local laws or ordinances. No provision of this article shall be construed as entitling the Contractor to compensation for delays due to inclement weather or for any other delay provided for in the contract, plans, or specifications.

If it becomes necessary to suspend work for an indefinite period, the Contractor shall store all materials in such manner that they will not become an obstruction nor become damaged in any way. The Contractor shall take every precaution to prevent damage or deterioration of the work performed and provide for normal drainage of the work. The Contractor shall erect temporary structures where necessary to provide for traffic on, to, or from the airport.

80-07 Determination and extension of contract time. The number of calendar days shall be stated in the proposal and contract and shall be known as the Contract Time.

If the contract time requires extension for reasons beyond the Contractor's control, it shall be adjusted as follows:

80-07.1 Contract time based on calendar days. Contract Time based on calendar days shall consist of the number of calendar days stated in the contract counting from the effective date of the Notice to Proceed and including all Saturdays, Sundays, holidays, and non-work days. All calendar days elapsing between the effective dates of the Owner's orders to suspend and resume all work, due to causes not the fault of the Contractor, shall be excluded.

At the time of final payment, the contract time shall be increased in the same proportion as the cost of the actually completed quantities bears to the cost of the originally estimated quantities in the proposal. Such increase in the contract time shall not consider either cost of work or the extension of contract time that has been covered by a change order or supplemental agreement. Charges against the contract time will cease as of the date of final acceptance.

80-08 Failure to complete on time. For each calendar day or working day, as specified in the contract, that any work remains uncompleted after the contract time (including all extensions and adjustments as provided in paragraph 80-07, *Determination and Extension of Contract Time*) the sum specified in the contract and proposal as liquidated damages (LD) will be deducted from any money due or to become due the Contractor or their own surety. Such deducted sums shall not be deducted as a penalty but shall be considered as liquidation of a reasonable portion of damages including but not limited to additional engineering services that will be incurred by the Owner should the Contractor fail to complete the work in the time provided in their contract. Permitting the Contractor to continue and finish the work or any part of it after the time fixed for its completion, or after the date to which the time for completion may have been extended, will in no way operate as a wavier on the part of the Owner of any of its rights under the contract.

Schedule	Liquidated Damages Cost	Allowed Construction Time
Base Bid	$1,500	60 Calendar Days
Add Alternate 1	$1,500	60 Calendar Days
Add Alternate 2	$750	30 Calendar Days

80-09 Default and termination of contract. The Contractor shall be considered in default of their contract and such default will be considered as cause for the Owner to terminate the contract for any of the following reasons, if the Contractor:

a. Fails to begin the work under the contract within the time specified in the Notice to Proceed, or

b. Fails to perform the work or fails to provide sufficient workers, equipment and/or materials to assure completion of work in accordance with the terms of the contract, or

c. Performs the work unsuitably or neglects or refuses to remove materials or to perform anew such work as may be rejected as unacceptable and unsuitable, or

d. Discontinues the execution of the work, or

e. Fails to resume work which has been discontinued within a reasonable time after notice to do so, or

f. Becomes insolvent or is declared bankrupt, or commits any act of bankruptcy or insolvency, or

g. Allows any final judgment to stand against the Contractor unsatisfied for a period of 10 days, or

h. Makes an assignment for the benefit of creditors, or

i. For any other cause whatsoever, fails to carry on the work in an acceptable manner.

Should the Owner consider the Contractor in default of the contract for any reason above, the Owner shall immediately give written notice to the Contractor and the Contractor's surety as to the reasons for considering the Contractor in default and the Owner's intentions to terminate the contract.

If the Contractor or surety, within a period of 10 days after such notice, does not proceed in accordance therewith, then the Owner will, upon written notification from the RPR of the facts of such delay, neglect, or default and the Contractor's failure to comply with such notice, have full power and authority without violating the contract, to take the execution of the work out of the hands of the Contractor. The Owner may appropriate or use any or all materials and equipment that have been mobilized for use in the work and are acceptable and may enter into an agreement for the completion of said contract according to the terms and provisions thereof, or use such other methods as in the opinion of the RPR will be required for the completion of said contract in an acceptable manner.

All costs and charges incurred by the Owner, together with the cost of completing the work under contract, will be deducted from any monies due or which may become due the Contractor. If such expense exceeds the sum which would have been payable under the contract, then the Contractor and the surety shall be liable and shall pay to the Owner the amount of such excess.

80-10 Termination for national emergencies. The Owner shall terminate the contract or portion thereof by written notice when the Contractor is prevented from proceeding with the construction contract as a direct result of an Executive Order of the President with respect to the execution of war or in the interest of national defense.

When the contract, or any portion thereof, is terminated before completion of all items of work in the contract, payment will be made for the actual number of units or items of work completed at the contract price or as mutually agreed for items of work partially completed or not started. No claims or loss of anticipated profits shall be considered.

Reimbursement for organization of the work, and other overhead expenses, (when not otherwise included in the contract) and moving equipment and materials to and from the job will be considered, the intent being that an equitable settlement will be made with the Contractor.

Acceptable materials, obtained or ordered by the Contractor for the work and that are not incorporated in the work shall, at the option of the Contractor, be purchased from the Contractor at actual cost as shown by receipted bills and actual cost records at such points of delivery as may be designated by the RPR.

Termination of the contract or a portion thereof shall neither relieve the Contractor of their responsibilities for the completed work nor shall it relieve their surety of its obligation for and concerning any just claim arising out of the work performed.

80-11 Work area, storage area and sequence of operations. The Contractor shall obtain approval from the RPR prior to beginning any work in all areas of the airport. No operating runway, taxiway, or air

operations area (AOA) shall be crossed, entered, or obstructed while it is operational. The Contractor shall plan and coordinate work in accordance with the approved CSPP and SPCD.

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Section 90 Measurement and Payment

90-01 Measurement of quantities. All work completed under the contract will be measured by the RPR, or their authorized representatives, using United States Customary Units of Measurement.

The method of measurement and computations to be used in determination of quantities of material furnished and of work performed under the contract will be those methods generally recognized as conforming to good engineering practice.

Unless otherwise specified, longitudinal measurements for area computations will be made horizontally, and no deductions will be made for individual fixtures (or leave-outs) having an area of 9 square feet (0.8 square meters) or less. Unless otherwise specified, transverse measurements for area computations will be the neat dimensions shown on the plans or ordered in writing by the RPR.

Unless otherwise specified, all contract items which are measured by the linear foot such as electrical ducts, conduits, pipe culverts, underdrains, and similar items shall be measured parallel to the base or foundation upon which such items are placed.

The term “lump sum” when used as an item of payment will mean complete payment for the work described in the contract. When a complete structure or structural unit (in effect, “lump sum” work) is specified as the unit of measurement, the unit will be construed to include all necessary fittings and accessories.

When requested by the Contractor and approved by the RPR in writing, material specified to be measured by the cubic yard (cubic meter) may be weighed, and such weights will be converted to cubic yards (cubic meters) for payment purposes. Factors for conversion from weight measurement to volume measurement will be determined by the RPR and shall be agreed to by the Contractor before such method of measurement of pay quantities is used.

Measurement and Payment Terms

Term	Description
Excavation and Embankment Volume	In computing volumes of excavation, the average end area method will be used unless otherwise specified.
Measurement and Proportion by Weight	The term “ton” will mean the short ton consisting of 2,000 pounds (907 kg) avoirdupois. All materials that are measured or proportioned by weights shall be weighed on accurate, independently certified scales by competent, qualified personnel at locations designated by the RPR. If material is shipped by rail, the car weight may be accepted provided that only the actual weight of material is paid for. However, car weights will not be acceptable for material to be passed through mixing plants. Trucks used to haul material being paid for by weight shall be weighed empty daily at such times as the RPR directs, and each truck shall bear a plainly legible identification mark.
Measurement by Volume	Materials to be measured by volume in the hauling vehicle shall be hauled in approved vehicles and measured therein at the point of delivery. Vehicles for this purpose may be of any size or type acceptable for the materials hauled, provided that the body is of such shape that the actual contents may be readily and accurately determined. All vehicles shall be loaded to at least their water level

Term	Description
	capacity, and all loads shall be leveled when the vehicles arrive at the point of delivery.
Asphalt Material	Asphalt materials will be measured by the gallon (liter) or ton (kg). When measured by volume, such volumes will be measured at 60°F (16°C) or will be corrected to the volume at 60°F (16°C) using ASTM D1250 for asphalts. Net certified scale weights or weights based on certified volumes in the case of rail shipments will be used as a basis of measurement, subject to correction when asphalt material has been lost from the car or the distributor, wasted, or otherwise not incorporated in the work. When asphalt materials are shipped by truck or transport, net certified weights by volume, subject to correction for loss or foaming, will be used for computing quantities.
Cement	Cement will be measured by the ton (kg) or hundredweight (km).
Structure	Structures will be measured according to neat lines shown on the plans or as altered to fit field conditions.
Timber	Timber will be measured by the thousand feet board measure (MFBM) actually incorporated in the structure. Measurement will be based on nominal widths and thicknesses and the extreme length of each piece.
Plates and Sheets	The thickness of plates and galvanized sheet used in the manufacture of corrugated metal pipe, metal plate pipe culverts and arches, and metal cribbing will be specified and measured in decimal fraction of inch.
Miscellaneous Items	When standard manufactured items are specified such as fence, wire, plates, rolled shapes, pipe conduit, etc., and these items are identified by gauge, unit weight, section dimensions, etc., such identification will be considered to be nominal weights or dimensions. Unless more stringently controlled by tolerances in cited specifications, manufacturing tolerances established by the industries involved will be accepted.
Scales	Scales must be tested for accuracy and serviced before use. Scales for weighing materials which are required to be proportioned or measured and paid for by weight shall be furnished, erected, and maintained by the Contractor, or be certified permanently installed commercial scales. Platform scales shall be installed and maintained with the platform level and rigid bulkheads at each end. Scales shall be accurate within 0.5% of the correct weight throughout the range of use. The Contractor shall have the scales checked under the observation of the RPR before beginning work and at such other times as requested. The intervals shall be uniform in spacing throughout the graduated or marked length of the beam or dial and shall not exceed 0.1% of the nominal rated capacity of the scale, but not less than one pound (454 grams). The use of spring balances will not be permitted. In the event inspection reveals the scales have been “overweighing” (indicating more than correct weight) they will be immediately adjusted. All materials

Term	Description
	received subsequent to the last previous correct weighting-accuracy test will be reduced by the percentage of error in excess of 0.5%. In the event inspection reveals the scales have been under-weighing (indicating less than correct weight), they shall be immediately adjusted. No additional payment to the Contractor will be allowed for materials previously weighed and recorded. Beams, dials, platforms, and other scale equipment shall be so arranged that the operator and the RPR can safely and conveniently view them. Scale installations shall have available ten standard 50-pound (2.3 km) weights for testing the weighing equipment or suitable weights and devices for other approved equipment. All costs in connection with furnishing, installing, certifying, testing, and maintaining scales; for furnishing check weights and scale house; and for all other items specified in this subsection, for the weighing of materials for proportioning or payment, shall be included in the unit contract prices for the various items of the project.
Rental Equipment	Rental of equipment will be measured by time in hours of actual working time and necessary traveling time of the equipment within the limits of the work. Special equipment ordered in connection with extra work will be measured as agreed in the change order or supplemental agreement authorizing such work as provided in paragraph 90-05 *Payment for Extra Work*.
Pay Quantities	When the estimated quantities for a specific portion of the work are designated as the pay quantities in the contract, they shall be the final quantities for which payment for such specific portion of the work will be made, unless the dimensions of said portions of the work shown on the plans are revised by the RPR. If revised dimensions result in an increase or decrease in the quantities of such work, the final quantities for payment will be revised in the amount represented by the authorized changes in the dimensions.

90-02 Scope of payment. The Contractor shall receive and accept compensation provided for in the contract as full payment for furnishing all materials, for performing all work under the contract in a complete and acceptable manner, and for all risk, loss, damage, or expense of whatever character arising out of the nature of the work or the execution thereof, subject to the provisions of Section 70, paragraph 70-18, *No Waiver of Legal Rights*.

When the "basis of payment" subsection of a technical specification requires that the contract price (price bid) include compensation for certain work or material essential to the item, this same work or material will not also be measured for payment under any other contract item which may appear elsewhere in the contract, plans, or specifications.

90-03 Compensation for altered quantities. When the accepted quantities of work vary from the quantities in the proposal, the Contractor shall accept as payment in full, so far as contract items are concerned, payment at the original contract price for the accepted quantities of work actually completed and accepted. No allowance, except as provided for in Section 40, paragraph 40-02, *Alteration of Work and Quantities,* will be made for any increased expense, loss of expected reimbursement, or loss of anticipated profits suffered or claimed by the Contractor which results directly from such alterations or

indirectly from their own unbalanced allocation of overhead and profit among the contract items, or from any other cause.

90-04 Payment for omitted items. As specified in Section 40, paragraph 40-03, *Omitted Items,* the RPR shall have the right to omit from the work (order nonperformance) any contract item, except major contract items, in the best interest of the Owner.

Should the RPR omit or order nonperformance of a contract item or portion of such item from the work, the Contractor shall accept payment in full at the contract prices for any work actually completed and acceptable prior to the RPR's order to omit or non-perform such contract item.

Acceptable materials ordered by the Contractor or delivered on the work prior to the date of the RPR's order will be paid for at the actual cost to the Contractor and shall thereupon become the property of the Owner.

In addition to the reimbursement hereinbefore provided, the Contractor shall be reimbursed for all actual costs incurred for the purpose of performing the omitted contract item prior to the date of the RPR's order. Such additional costs incurred by the Contractor must be directly related to the deleted contract item and shall be supported by certified statements by the Contractor as to the nature the amount of such costs.

90-05 Payment for extra work. Extra work, performed in accordance with Section 40, paragraph 40-04, *Extra Work*, will be paid for at the contract prices or agreed prices specified in the change order or supplemental agreement authorizing the extra work.

90-06 Partial payments. Partial payments will be made to the Contractor at least once each month as the work progresses. Said payments will be based upon estimates, prepared by the RPR, of the value of the work performed and materials complete and in place, in accordance with the contract, plans, and specifications. Such partial payments may also include the delivered actual cost of those materials stockpiled and stored in accordance with paragraph 90-07, *Payment for Materials on Hand*. No partial payment will be made when the amount due to the Contractor since the last estimate amounts to less than five hundred dollars.

From the total of the amount determined to be payable on a partial payment, 10 percent of such total amount will be deducted and retained by the Owner for the initial 50 percent of the total contract work, and then 0 percent thereafter, for protection of the Owner's interests. Unless otherwise instructed by the Owner, the amount retained by the Owner will be in effect until the final payment is made except as follows:

(1) Contractor may request release of retainage on work that has been partially accepted by the Owner in accordance with Section 50-14. Contractor must provide a certified invoice to the RPR that supports the value of retainage held by the Owner for partially accepted work.

(2) In lieu of retainage, the Contractor may exercise at its option the establishment of an escrow account per paragraph 90-08.

The Contractor is required to pay all subcontractors for satisfactory performance of their contracts no later than 30 days after the Contractor has received a partial payment. Contractor must provide the Owner evidence of prompt and full payment of retainage held by the prime Contractor to the subcontractor within 30 days after the subcontractor's work is satisfactorily completed. A subcontractor's work is satisfactorily completed when all the tasks called for in the subcontract have been accomplished and documented as required by the Owner. When the Owner has made an incremental acceptance of a portion of a prime contract, the work of a subcontractor covered by that acceptance is deemed to be satisfactorily completed.

When at least 95% of the work has been completed to the satisfaction of the RPR, the RPR shall, at the Owner's discretion and with the consent of the surety, prepare estimates of both the contract value and the cost of the remaining work to be done. The Owner may retain an amount not less than twice the contract value or estimated cost, whichever is greater, of the work remaining to be done. The remainder, less all previous payments and deductions, will then be certified for payment to the Contractor

It is understood and agreed that the Contractor shall not be entitled to demand or receive partial payment based on quantities of work in excess of those provided in the proposal or covered by approved change orders or supplemental agreements, except when such excess quantities have been determined by the RPR to be a part of the final quantity for the item of work in question.

No partial payment shall bind the Owner to the acceptance of any materials or work in place as to quality or quantity. All partial payments are subject to correction at the time of final payment as provided in paragraph 90-09, *Acceptance and Final Payment*.

The Contractor shall deliver to the Owner a complete release of all claims for labor and material arising out of this contract before the final payment is made. If any subcontractor or supplier fails to furnish such a release in full, the Contractor may furnish a bond or other collateral satisfactory to the Owner to indemnify the Owner against any potential lien or other such claim. The bond or collateral shall include all costs, expenses, and attorney fees the Owner may be compelled to pay in discharging any such lien or claim.

90-07 Payment for materials on hand. Partial payments may be made to the extent of the delivered cost of materials to be incorporated in the work, provided that such materials meet the requirements of the contract, plans, and specifications and are delivered to acceptable sites on the airport property or at other sites in the vicinity that are acceptable to the Owner. Such delivered costs of stored or stockpiled materials may be included in the next partial payment after the following conditions are met:

a. The material has been stored or stockpiled in a manner acceptable to the RPR at or on an approved site.

b. The Contractor has furnished the RPR with acceptable evidence of the quantity and quality of such stored or stockpiled materials.

c. The Contractor has furnished the RPR with satisfactory evidence that the material and transportation costs have been paid.

d. The Contractor has furnished the Owner legal title (free of liens or encumbrances of any kind) to the material stored or stockpiled.

e. The Contractor has furnished the Owner evidence that the material stored or stockpiled is insured against loss by damage to or disappearance of such materials at any time prior to use in the work.

It is understood and agreed that the transfer of title and the Owner's payment for such stored or stockpiled materials shall in no way relieve the Contractor of their responsibility for furnishing and placing such materials in accordance with the requirements of the contract, plans, and specifications.

In no case will the amount of partial payments for materials on hand exceed the contract price for such materials or the contract price for the contract item in which the material is intended to be used.

No partial payment will be made for stored or stockpiled living or perishable plant materials.

The Contractor shall bear all costs associated with the partial payment of stored or stockpiled materials in accordance with the provisions of this paragraph.

90-08 Payment of withheld funds. At the Contractor's option, if an Owner withholds retainage in accordance with the methods described in paragraph 90-06 *Partial Payments*, the Contractor may request

that the Owner deposit the retainage into an escrow account. The Owner's deposit of retainage into an escrow account is subject to the following conditions:

a. The Contractor shall bear all expenses of establishing and maintaining an escrow account and escrow agreement acceptable to the Owner.

b. The Contractor shall deposit to and maintain in such escrow only those securities or bank certificates of deposit as are acceptable to the Owner and having a value not less than the retainage that would otherwise be withheld from partial payment.

c. The Contractor shall enter into an escrow agreement satisfactory to the Owner.

d. The Contractor shall obtain the written consent of the surety to such agreement.

90-09 Acceptance and final payment. When the contract work has been accepted in accordance with the requirements of Section 50, paragraph 50-15, *Final Acceptance*, the RPR will prepare the final estimate of the items of work actually performed. The Contractor shall approve the RPR's final estimate or advise the RPR of the Contractor's objections to the final estimate which are based on disputes in measurements or computations of the final quantities to be paid under the contract as amended by change order or supplemental agreement. The Contractor and the RPR shall resolve all disputes (if any) in the measurement and computation of final quantities to be paid within 30 calendar days of the Contractor's receipt of the RPR's final estimate. If, after such 30-day period, a dispute still exists, the Contractor may approve the RPR's estimate under protest of the quantities in dispute, and such disputed quantities shall be considered by the Owner as a claim in accordance with Section 50, paragraph 50-16, *Claims for Adjustment and Disputes*.

After the Contractor has approved, or approved under protest, the RPR's final estimate, and after the RPR's receipt of the project closeout documentation required in paragraph 90-11, *Contractor Final Project Documentation*, final payment will be processed based on the entire sum, or the undisputed sum in case of approval under protest, determined to be due the Contractor less all previous payments and all amounts to be deducted under the provisions of the contract. All prior partial estimates and payments shall be subject to correction in the final estimate and payment.

If the Contractor has filed a claim for additional compensation under the provisions of Section 50, paragraph 50-16, *Claims for Adjustments and Disputes,* or under the provisions of this paragraph, such claims will be considered by the Owner in accordance with local laws or ordinances. Upon final adjudication of such claims, any additional payment determined to be due the Contractor will be paid pursuant to a supplemental final estimate.

90-10 Construction warranty.

a. In addition to any other warranties in this contract, the Contractor warrants that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, workmanship, or design furnished, or performed by the Contractor or any subcontractor or supplier at any tier.

b. This warranty shall continue for a period of one year from the date of final acceptance of the work, except as noted. If the Owner takes possession of any part of the work before final acceptance, this warranty shall continue for a period of one year from the date the Owner takes possession. However, this will not relieve the Contractor from corrective items required by the final acceptance of the project work. Light Emitting Diode emitting diode (LED) light fixtures with the exception of obstruction lighting, must be warranted by the manufacturer for a minimum of four (4) years after date of installation inclusive of all electronics.

c. The Contractor shall remedy at the Contractor's expense any failure to conform, or any defect. In addition, the Contractor shall remedy at the Contractor's expense any damage to Owner real or personal

property, when that damage is the result of the Contractor's failure to conform to contract requirements; or any defect of equipment, material, workmanship, or design furnished by the Contractor.

d. The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for one year from the date of repair or replacement.

e. The Owner will notify the Contractor, in writing, within seven (7) days after the discovery of any failure, defect, or damage.

f. If the Contractor fails to remedy any failure, defect, or damage within 14 days after receipt of notice, the Owner shall have the right to replace, repair, or otherwise remedy the failure, defect, or damage at the Contractor's expense.

g. With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall: (1) Obtain all warranties that would be given in normal commercial practice; (2) Require all warranties to be executed, in writing, for the benefit of the Owner, as directed by the Owner, and (3) Enforce all warranties for the benefit of the Owner.

h. This warranty shall not limit the Owner's rights with respect to latent defects, gross mistakes, or fraud.

90-11 Contractor Final Project Documentation. Approval of final payment to the Contractor is contingent upon completion and submittal of the items listed below. The final payment will not be approved until the RPR approves the Contractor's final submittal. The Contractor shall:

a. Provide two (2) copies of all manufacturer's warranties specified for materials, equipment, and installations.

b. Provide weekly payroll records (not previously received) from the general Contractor and all subcontractors.

c. Complete final cleanup in accordance with Section 40, paragraph 40-08, *Final Cleanup*.

d. Complete all punch list items identified during the Final Inspection.

e. Provide complete release of all claims for labor and material arising out of the Contract.

f. Provide a certified statement signed by the subcontractors, indicating actual amounts paid to the Disadvantaged Business Enterprise (DBE) subcontractors and/or suppliers associated with the project.

g. When applicable per state requirements, return copies of sales tax completion forms.

h. Manufacturer's certifications for all items incorporated in the work.

i. All required record drawings, as-built drawings or as-constructed drawings.

j. Project Operation and Maintenance (O&M) Manual(s).

k. Security for Construction Warranty.

l. Equipment commissioning documentation submitted, if required.

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for Airport Improvement Program (AIP)Projects

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CONTRACT GUIDANCE

a) Federal laws and regulations require that a Sponsor (a recipient of federal assistance) include specific clauses in certain contracts, solicitations, or specifications regardless of whether or not the project is federally funded.

b) For purposes of remaining compliant with its obligations, a Sponsor must incorporate applicable contract provisions in all its procurements and contract documents. Unless otherwise stated, these provisions flow down to subcontracts and sub-tier agreements.

d) Require the contractor (including all subcontractors) to insert these contract provisions in each lower tier contract (e.g., subcontract or sub-agreement).

e) Require the contractor (including all subcontractors) to incorporate the requirements of these contract provisions by reference for work done under any purchase orders, rental agreements, and other agreements for supplies or services.

f) Require that the prime contractor be responsible for compliance with these contract provisions by any subcontractor, lower-tier subcontractor, or service provider.

g) Verify that any required local or State provision does not conflict with or alter a Federal law or regulation.

A1 ACCESS TO RECORDS AND REPORTS

SOURCE: 2 CFR § 200.334, 2 CFR § 200.337, FAA Order 5100.38

The Contractor must maintain an acceptable cost accounting system. The Contractor agrees to provide the Owner, the Federal Aviation Administration and the Comptroller General of the United States or any of their duly authorized representatives access to any books, documents, papers and records of the Contractor which are directly pertinent to the specific contract for the purpose of making audit, examination, excerpts and transcriptions. The Contractor agrees to maintain all books, records and reports required under this contract for a period of not less than three years after final payment is made and all pending matters are closed.

A2 BREACH OF CONTRACT TERMS

SOURCE: 2 CFR Part 200, Appendix II(A)

Any violation or breach of terms of this contract on the part of the [*Contractor* | *Consultant*] or its subcontractors may result in the suspension or termination of this contract or such other action that may be necessary to enforce the rights of the parties of this agreement.

Owner will provide [*Contractor* | *Consultant*] written notice that describes the nature of the breach and corrective actions the [*Contractor* | *Consultant*] must undertake in order to avoid termination of the contract. Owner reserves the right to withhold payments to Contractor until such time the Contractor corrects the breach or the Owner elects to terminate the contract. The Owner's notice will identify a specific date by which the [*Contractor* | *Consultant*] must correct the breach. Owner may proceed with termination of the contract if the [*Contractor* | *Consultant*] fails to correct the breach by the deadline indicated in the Owner's notice.

The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder are in addition to, and not a limitation of, any duties, obligations, rights and remedies otherwise imposed or available by law.

A3 BUY AMERICAN PREFERENCE

SOURCE: Title 49 U.S.C. § 50101; Executive Order 14005, Ensuring the Future is Made in All of America by All of America's Workers; Infrastructure Investment and Jobs Act (IIJA) (P.L. No. 117-58), Build America, Buy America (BABA)

The Contractor certifies that its bid/offer is in compliance with 49 U.S.C. § 50101, BABA and other related Made in America Laws,[1] U.S. statutes, guidance, and FAA policies, which provide that Federal funds may not be obligated unless all iron, steel and manufactured goods used in AIP funded projects are produced in the United States, unless the Federal Aviation Administration has issued a waiver for the product; the product is listed as an Excepted Article, Material Or Supply in Federal Acquisition Regulation subpart 25.108; or is included in the FAA Nationwide Buy American Waivers Issued list.

The bidder or offeror must complete and submit the certification of compliance with FAA's Buy American Preference, BABA and Made in America laws included herein with their bid or offer. **The**

[1] Per Executive Order 14005 "Made in America Laws" means all statutes, regulations, rules, and Executive Orders relating to federal financial assistance awards or federal procurement, including those that refer to "Buy America" or "Buy American," that require, or provide a preference for, the purchase or acquisition of goods, products, or materials produced in the United States, including iron, steel, and manufactured products offered in the United States.

Airport Sponsor/Owner will reject as nonresponsive any bid or offer that does not include a completed certification of compliance with FAA's Buy American Preference and BABA.

(See Proposal Forms for Required Certifications)

The bidder or offeror certifies that all constructions materials, defined to mean an article, material, or supply other than an item of primarily iron or steel; a manufactured product; cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives that are or consist primarily of: non-ferrous metals; plastic and polymer-based products (including polyvinylchloride, composite building materials, and polymers used in fiber optic cables); glass (including optic glass); lumber; or drywall used in the project are manufactured in the U.S.

The bidder or offeror certifies procurement of certain rolling stock using FAA grant funds will prohibit airports from using Federal financial assistance to procure buses or rail car vehicle rolling stock from covered entities.

A4 CIVIL RIGHTS - GENERAL

49 U.S.C. § 47123

GENERAL CIVIL RIGHTS PROVISIONS

In all its activities within the scope of its airport program, the Contractor agrees to comply with pertinent statutes, Executive Orders, and such rules as identified in Title VI List of Pertinent Nondiscrimination Acts and Authorities to ensure that no person shall, on the grounds of race, color, national origin, creed, sex, age, or disability be excluded from participating in any activity conducted with or benefiting from Federal assistance.

This provision is in addition to that required by Title VI of the Civil Rights Act of 1964.

The above provision binds the Contractor and subcontractors from the bid solicitation period through the completion of the contract.

A5 CIVIL RIGHTS – TITLE VI ASSURANCE

49 U.S.C. § 47123; FAA Order 1400.11;

Title VI Solicitation Notice:

As a condition of a grant award, the Sponsor shall demonstrate that it complies with the provisions of Title VI of the Civil Rights Act of 1964 (42 U.S.C. §§ 2000d et seq) and implementing regulations (49 CFR part 21) including amendments thereto, the Airport and Airway Improvement Act of 1982 (49 U.S.C. § 47123), the Age Discrimination Act of 1975 (42 U.S.C. 6101 et seq.), Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. § 794 et seq.), the Americans with Disabilities Act of 1990 (42 U.S.C. § 12101, et seq.), U.S. Department of Transportation and Federal Aviation Administration (FAA) Assurances, and other relevant civil rights statutes, regulations, or authorities, including any amendments or updates thereto. This may include, as applicable, providing a current Title VI Program Plan to the FAA for approval, in the format and according to the timeline required by the FAA, and other information about the communities that will be benefited and impacted by the project. A completed FAA Title VI Pre-Grant Award Checklist is required for every grant application, unless excused by the FAA. The Sponsor shall affirmatively ensure that when carrying out any project supported by this grant that it complies with all federal nondiscrimination and civil rights laws based on race, color, national origin, sex, creed, age, disability, genetic information, in consideration for federal financial assistance. The Department's and FAA's Office of Civil Rights may provide resources and technical assistance to recipients to ensure full and sustainable compliance with Federal civil rights requirements. Failure to comply with civil rights

requirements will be considered a violation of the agreement or contract and be subject to any enforcement action as authorized by law.

Title VI List of Pertinent Nondiscrimination Acts and Authorities

(Insert this list in every contract or agreement.)

During the performance of this contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor") agrees to comply with the following non-discrimination statutes and authorities; including but not limited to:

- Title VI of the Civil Rights Act of 1964 (42 U.S.C. § 2000d *et seq*., 78 stat. 252) (prohibits discrimination on the basis of race, color, national origin);
- 49 CFR Part 21 (Non-discrimination in Federally-Assisted programs of the Department of Transportation—Effectuation of Title VI of the Civil Rights Act of 1964) including amendments thereto;
- The Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, (42 U.S.C. § 4601) (prohibits unfair treatment of persons displaced or whose property has been acquired because of Federal or Federal-aid programs and projects);
- Section 504 of the Rehabilitation Act of 1973 (29 U.S.C. § 794 *et seq*.), as amended (prohibits discrimination on the basis of disability); and 49 CFR part 27 (Nondiscrimination on the Basis of Disability in Programs or Activities Receiving Federal Financial Assistance);
- The Age Discrimination Act of 1975, as amended (42 .U.S.C. § 6101 *et seq*.) (prohibits discrimination on the basis of age);
- Airport and Airway Improvement Act of 1982 (49 U.S.C. § 47123), as amended (prohibits discrimination based on race, creed, color, national origin, or sex);
- The Civil Rights Restoration Act of 1987 (P.L. 100-259) (broadened the scope, coverage and applicability of Title VI of the Civil Rights Act of 1964, the Age Discrimination Act of 1975 and Section 504 of the Rehabilitation Act of 1973, by expanding the definition of the terms "programs or activities" to include all of the programs or activities of the Federal-aid recipients, sub-recipients and contractors, whether such programs or activities are Federally funded or not);
- Titles II and III of the Americans with Disabilities Act of 1990 (42 U.S.C. § 12101, et seq) (prohibit discrimination on the basis of disability in the operation of public entities, public and private transportation systems, places of public accommodation, and certain testing entities) as implemented by U.S. Department of Transportation regulations at 49 CFR Parts 37 and 38;
- Title IX of the Education Amendments of 1972, as amended, which prohibits you from discriminating because of sex in education programs or activities (20 U.S.C. § 1681, et seq).

Compliance with Nondiscrimination Requirements:

During the performance of this contract, the Contractor, for itself, its assignees, and successors in interest (hereinafter referred to as the "Contractor"), agrees as follows:

1. **Compliance with Regulations:** The Contractor (hereinafter includes consultants) will comply with the Title VI List of Pertinent Nondiscrimination Acts and Authorities, as they

may be amended from time to time, which are herein incorporated by reference and made a part of this contract.

2. **Nondiscrimination:** The Contractor, with regard to the work performed by it during the contract, will not discriminate on the grounds of race, color, national origin), creed, sex, age, or disability in the selection and retention of subcontractors, including procurements of materials and leases of equipment. The Contractor will not participate directly or indirectly in the discrimination prohibited by the Nondiscrimination Acts and Authorities, including employment practices when the contract covers any activity, project, or program set forth in Appendix B of 49 CFR part 21 including amendments thereto.

3. **Solicitations for Subcontracts, including Procurements of Materials and Equipment:** In all solicitations, either by competitive bidding or negotiation made by the Contractor for work to be performed under a subcontract, including procurements of materials, or leases of equipment, each potential subcontractor or supplier will be notified by the Contractor of the contractor's obligations under this contract and the Nondiscrimination Acts and Authorities on the grounds of race, color, or national origin.

4. **Information and Reports:** The Contractor will provide all information and reports required by the Acts, the Regulations, and directives issued pursuant thereto and will permit access to its books, records, accounts, other sources of information, and its facilities as may be determined by the Sponsor or the Federal Aviation Administration to be pertinent to ascertain compliance with such Nondiscrimination Acts and Authorities and instructions. Where any information required of a contractor is in the exclusive possession of another who fails or refuses to furnish the information, the Contractor will so certify to the Sponsor or the Federal Aviation Administration, as appropriate, and will set forth what efforts it has made to obtain the information.

5. **Sanctions for Noncompliance: In** the event of a Contractor's noncompliance with the non-discrimination provisions of this contract, the Sponsor will impose such contract sanctions as it or the Federal Aviation Administration may determine to be appropriate, including, but not limited to:

    a. Withholding payments to the Contractor under the contract until the Contractor complies; and/or

    b. Cancelling, terminating, or suspending a contract, in whole or in part.

6. **Incorporation of Provisions:** The Contractor will include the provisions of paragraphs one through six in every subcontract, including procurements of materials and leases of equipment, unless exempt by the Acts, the Regulations, and directives issued pursuant thereto. The Contractor will take action with respect to any subcontract or procurement as the Sponsor or the Federal Aviation Administration may direct as a means of enforcing such provisions including sanctions for noncompliance. Provided, that if the Contractor becomes involved in, or is threatened with litigation by a subcontractor, or supplier because of such direction, the Contractor may request the Sponsor to enter into any litigation to protect the interests of the Sponsor. In addition, the Contractor may request the United States to enter into the litigation to protect the interests of the United States.

A6 CLEAN AIR AND WATER POLLUTION CONTROL

2 CFR Part 200, Appendix II(G); 42 U.S.C. § 7401, et seq; 33 U.S.C. § 1251, et seq

(Contractor must include this requirement in all subcontracts that exceed $150,000.)

Contractor agrees to comply with all applicable standards, orders, and regulations issued pursuant to the Clean Air Act (42 U.S.C. §§ 7401-7671q) and the Federal Water Pollution Control Act as amended (33 U.S.C. §§ 1251-1387). The Contractor agrees to report any violation to the Owner immediately upon discovery. The Owner assumes responsibility for notifying the Environmental Protection Agency (EPA) and the Federal Aviation Administration.

A7 CONTRACT WORKHOURS AND SAFETY STANDARDS ACT REQUIREMENTS

2 CFR Part 200, Appendix II(E); 29 CFR § 5.5(b); 40 U.S.C. § 3702; 40 U.S.C. § 3704

Contract Work Hours and Safety Standards Act Requirements (CWHSSA) (40 U.S.C. §§ 3702 & 3704) requires contractors and subcontractors on covered contracts to pay laborers and mechanics employed in the performance of the contracts not less than one and one-half times their basic rate of pay for all hours worked over 40 in a workweek. CWHSSA prohibits unsanitary, hazardous, or dangerous working conditions on federally-assisted projects. The Wage and Hour Division (WHD) within the U.S. Department of Labor (DOL) enforces the compensation requirements of this Act, while DOL's Occupational Safety and Health Administration (OSHA) enforces the safety and health requirements.

CONTRACT WORKHOURS AND SAFETY STANDARDS ACT REQUIREMENTS

1. Overtime Requirements.

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic, including watchmen and guards, in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

2. Violation; Liability for Unpaid Wages; Liquidated Damages.

In the event of any violation of the clause set forth in paragraph (1) of this clause, the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (1) of this clause, in the sum of $29 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (1) of this clause.

3. Withholding for Unpaid Wages and Liquidated Damages.

The Federal Aviation Administration (FAA) or the Owner shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (2) of this clause.

4. Subcontractors.

The Contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraphs (1) through (4) and also a clause requiring the subcontractor to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (1) through (4) of this clause.

A8 COPELAND "ANTI-KICKBACK" ACT

SOURCE: 2 CFR Part 200, Appendix II(D); 29 CFR Parts 3 and 5

COPELAND "ANTI-KICKBACK" ACT

Contractor must comply with the requirements of the Copeland "Anti-Kickback" Act (18 USC 874 and 40 USC 3145), as supplemented by Department of Labor regulation 29 CFR part 3. Contractor and subcontractors are prohibited from inducing, by any means, any person employed on the project to give up any part of the compensation to which the employee is entitled. The Contractor and each Subcontractor must submit to the Owner, a weekly statement on the wages paid to each employee performing on covered work during the prior week. Owner must report any violations of the Act to the Federal Aviation Administration.

A9 DAVIS-BACON REQUIREMENTS

SOURCE 2 CFR Part 200, Appendix II(D); 29 CFR Part 5; 49 USC § 47112(b); 40 USC §§ 3141-3144, 3146, and 3147

The Davis-Bacon Act (40 USC §§ 3141-3144, 3146, and 3147) ensures that laborers and mechanics employed under the contract receive pay no less than the locally prevailing wages and fringe benefits as determined by the Department of Labor.

DAVIS-BACON REQUIREMENTS

1. Minimum Wages.

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by the Secretary of Labor under regulations implementing the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalent thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: *Provided,* that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under (1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can easily be seen by the workers.

(ii)(A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination;

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the Contractor, the laborers, or mechanics to be employed in the classification, or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii) (B) or (C) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, *Provided,* that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

2. Withholding. The Federal Aviation Administration or the Sponsor shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract,

the Federal Aviation Administration may, after written notice to the Contractor, Sponsor, Applicant, or Owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

3. Payrolls and Basic Records.

(i) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker; his or her correct classification; hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in 1(b)(2)(B) of the Davis-Bacon Act); daily and weekly number of hours worked; deductions made; and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records that show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual costs incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Federal Aviation Administration if the agency is a party to the contract, but if the agency is not such a party, the Contractor will submit the payrolls to the applicant, Sponsor, or Owner, as the case may be, for transmission to the Federal Aviation Administration. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR § 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead, the payrolls shall only need to include an individually identifying number for each employee (*e.g.,* the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH–347 is available for this purpose from the Wage and Hour Division Web site at *https://www.dol.gov/agencies/whd/government-contracts/construction/payroll-certification* or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker and shall provide them upon request to the Federal Aviation Administration if the agency is a party to the contract, but if the agency is not such a party, the Contractor will submit them to the applicant, Sponsor, or Owner, as the case may be, for transmission to the Federal Aviation Administration, the Contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, Sponsor, or Owner).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under 29 CFR § 5.5(a)(3)(ii), the appropriate information is being maintained under 29 CFR § 5.5 (a)(3)(i), and that such information is correct and complete;

(2) That each laborer and mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The Contractor or subcontractor shall make the records required under paragraph (3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the Sponsor, the Federal Aviation Administration, or the Department of Labor and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the Contractor, Sponsor, applicant, or Owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR § 5.12.

4. Apprentices and Trainees.

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the

applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR § 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at no less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination that provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate that is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

5. Compliance with Copeland Act Requirements.

The Contractor shall comply with the requirements of 29 CFR Part 3, which are incorporated by reference in this contract.

6. Subcontracts.

The Contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR §§ 5.5(a)(1) through (10) and such other clauses as the Federal Aviation Administration may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR § 5.5.

7. Contract Termination: Debarment.

A breach of the contract clauses in paragraph 1 through 10 of this section may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR § 5.12.

8. Compliance with Davis-Bacon and Related Act Requirements.

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.

9. Disputes Concerning Labor Standards.

Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this

clause include disputes between the Contractor (or any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

10. Certification of Eligibility.

(i) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR § 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR § 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 USC § 1001.

A10 DEBARMENT AND SUSPENSION

SOURCE 2 CFR Part 180 (Subpart B); 2 CFR Part 200, Appendix II(H); 2 CFR Part 1200; DOT Order 4200.5; Executive Orders 12549 and 12689

CERTIFICATION OF OFFEROR/BIDDER REGARDING DEBARMENT

By submitting a bid/proposal under this solicitation, the bidder or offeror certifies that neither it nor its principals are presently debarred or suspended by any Federal department or agency from participation in this transaction.

CERTIFICATION OF LOWER TIER CONTRACTORS REGARDING DEBARMENT

The successful bidder, by administering each lower tier subcontract that exceeds $25,000 as a "covered transaction", must confirm each lower tier participant of a "covered transaction" under the project is not presently debarred or otherwise disqualified from participation in this federally-assisted project. The successful bidder will accomplish this by:

1. Checking the System for Award Management at website: http://www.sam.gov.
2. Collecting a certification statement similar to the Certification of Offeror /Bidder Regarding Debarment, above.
3. Inserting a clause or condition in the covered transaction with the lower tier contract.

If the Federal Aviation Administration later determines that a lower tier participant failed to disclose to a higher tier participant that it was excluded or disqualified at the time it entered the covered transaction, the FAA may pursue any available remedies, including suspension and debarment of the non-compliant participant.

A11 DISADVANTAGED BUSINESS ENTERPRISE

SOURCE: 49 CFR Part 26; 49 U.S.C. § 47113

REQUIRED PROVISIONS

Bid Information Submitted as a matter of **responsiveness**:
The Owner's award of this contract is conditioned upon Bidder or Offeror satisfying the good faith effort requirements of 49 CFR § 26.53.

As a condition of **responsiveness,** the Bidder or Offeror **must submit the following information with its proposal on the forms provided herein:**

1) The names and addresses of Disadvantaged Business Enterprise (DBE) firms that will participate in the contract;
2) A description of the work that each DBE firm will perform;
3) The dollar amount of the participation of each DBE firm listed under (1);

4) Written statement from Bidder or Offeror that attests their commitment to use the DBE firm(s) listed under (1) to meet the Owner's project goal
5) Written confirmation from each listed DBE firm that it is participating in the contract in the kind and amount of work provided in the prime contractor's commitment; and
6) If Bidder or Offeror cannot meet the advertised project DBE goal, evidence of good faith efforts undertaken by the Bidder or Offeror as described in appendix A to 49 CFR part 26 including any amendments thereto. The documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor was selected over a DBE for work on the contract.

Bid Information submitted as a matter of **responsibility**:
The Owner's award of this contract is conditioned upon Bidder or Offeror satisfying the good faith effort requirements of 49 CFR § 26.53.

As a condition of **responsibility,** every Bidder or Offeror must submit the following information on the forms provided herein **within five days after bid opening.**

1) The names and addresses of Disadvantaged Business Enterprise (DBE) firms that will participate in the contract;
2) A description of the work that each DBE firm will perform;
3) The dollar amount of the participation of each DBE firm listed under (1);
4) Written statement from Bidder or Offeror that attests their commitment to use the DBE firm(s) listed under (1) to meet the Owner's project goal;
5) Written confirmation from each listed DBE firm that it is participating in the contract in the kind and amount of work provided in the prime contractor's commitment; and
6) If Bidder or Offeror cannot meet the advertised project DBE goal, evidence of good faith efforts undertaken by the Bidder or Offeror as described in appendix A to 49 CFR Part 26 including any amendments thereto. The documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor was selected over a DBE for work on the contract.

Prime Contracts (Contracts Covered by a DBE Program)

Contract Assurance (49 CFR § 26.13; mandatory text)

The Contractor, subrecipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The Contractor shall carry out applicable requirements of 49 CFR Part 26, including any amendments thereto, in the award and administration of DOT-assisted contracts. Failure by the Contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the recipient deems appropriate, which may include, but is not limited to:

1) Withholding monthly progress payments;
2) Assessing sanctions;
3) Liquidated damages; and/or
4) Disqualifying the Contractor from future bidding as non-responsible.

Prompt Payment (49 CFR § 26.29; acceptable/sample text provided) –
The prime contractor agrees to pay each subcontractor under this prime contract for satisfactory performance of its contract no later than [specify number of days, not to exceed 30] days from the receipt of each payment the prime contractor receives from [Name of recipient]. The prime contractor

agrees further to return retainage payments to each subcontractor within [specify number of days, not to exceed 30] days after the subcontractor's work is satisfactorily completed. Any delay or postponement of payment from the above referenced time frame may occur only for good cause following written approval of the [Name of Recipient]. This clause applies to both DBE and non-DBE subcontractors.

Termination of DBE Subcontracts (49 CFR § 26.53(f))
The prime contractor must not terminate a DBE subcontractor listed in response to these specifications (or an approved substitute DBE firm) without prior written consent of [Name of Recipient]. This includes, but is not limited to, instances in which the prime contractor seeks to perform work originally designated for a DBE subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm.

The prime contractor shall utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the contractor obtains written consent [Name of Recipient]. Unless [Name of Recipient] consent is provided, the prime contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the listed DBE.

[Name of Recipient] may provide such written consent only if [Name of Recipient] agrees, for reasons stated in the concurrence document, that the prime contractor has good cause to terminate the DBE firm. For purposes of this paragraph, good cause includes the circumstances listed in 49 CFR § 26.53.

Before transmitting to [Name of Recipient] its request to terminate and/or substitute a DBE subcontractor, the prime contractor must give notice in writing to the DBE subcontractor, with a copy to [Name of Recipient], of its intent to request to terminate and/or substitute, and the reason for the request.

The prime contractor must give the DBE five days to respond to the prime contractor's notice and advise [Name of Recipient] and the contractor of the reasons, if any, why it objects to the proposed termination of its subcontract and why [Name of Recipient] should not approve the prime contractor's action. If required in a particular case as a matter of public necessity (e.g., safety), [Name of Recipient] may provide a response period shorter than five days.

In addition to post-award terminations, the provisions of this section apply to pre-award deletions of or substitutions for DBE firms put forward by offerors in negotiated procurements.

A12 DISTRACTED DRIVING

SOURCE: Executive Order 13513; DOT Order 3902.10SOURCE

TEXTING WHEN DRIVING

In accordance with Executive Order 13513, "Federal Leadership on Reducing Text Messaging While Driving", (10/1/2009) and DOT Order 3902.10, "Text Messaging While Driving", (12/30/2009), the Federal Aviation Administration encourages recipients of Federal grant funds to adopt and enforce safety policies that decrease crashes by distracted drivers, including policies to ban text messaging while driving when performing work related to a grant or subgrant.

In support of this initiative, the Owner encourages the Contractor to promote policies and initiatives for its employees and other work personnel that decrease crashes by distracted drivers, including policies that ban text messaging while driving motor vehicles while performing work activities associated with the project. The Contractor must include the substance of this clause in all sub-tier contracts exceeding $15,000 that involve driving a motor vehicle in performance of work activities associated with the project.

A13 PROHIBITION ON CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT

SOURCE 2 CFR § 200, Appendix II(K); 2 CFR § 200.216

Sponsors and subgrant recipients are prohibited from using AIP grant funds to:

a) Procure or obtain,
b) Extend or renew a contract to procure or obtain, or
c) Enter into a contract to procure or obtain certain covered telecommunications equipment.

These restrictions apply to telecommunication equipment, services, or systems that use covered telecommunications equipment or services as a substantial or essential component of any system or as critical technology as part of any system. Covered telecommunications equipment is equipment produced or provided by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of either).

(include the following provision in all AIP funded contracts and lower-tier contracts.)

PROHIBITION ON CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT

Contractor and Subcontractor agree to comply with mandatory standards and policies relating to use and procurement of certain telecommunications and video surveillance services or equipment in compliance with the National Defense Authorization Act P.L. 115-232, § 889(f)(1)).

A14 DRUG FREE WORKPLACE REQUIREMENTS

SOURCE 49 CFR Part 32 Drug-Free Workplace Act of 1988 (41 U.S.C. § 8101-8106, as amended)

No mandatory or recommended text provided because the requirements do not extend beyond the Sponsor level.

A15 FEDERAL FAIR LABOR STANDARDS ACT (FEDERAL MINIMUM WAGE)

SOURCE 29 USC § 201, et seq 2 CFR § 200.430

All contracts and subcontracts that result from this solicitation incorporate by reference the provisions of 29 CFR Part 201, et seq, the Federal Fair Labor Standards Act (FLSA), with the same force and effect as if given in full text. The FLSA sets minimum wage, overtime pay, recordkeeping, and child labor standards for full and part-time workers.

The *Contractor* has full responsibility to monitor compliance to the referenced statute or regulation. The *Contractor* must address any claims or disputes that arise from this requirement directly with the U.S. Department of Labor – Wage and Hour Division.

A16 LOBBYING AND INFLUENCING FEDERAL EMPLOYEES

SOURCE: 31 USC § 1352 – Byrd Anti-Lobbying Amendment; 2 CFR Part 200, Appendix II(I) 49 CFR Part 20, Appendix A

CERTIFICATION REGARDING LOBBYING

The Bidder or Offeror certifies by signing and submitting this bid or proposal, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the Bidder or Offeror, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.

(3) The undersigned shall require that the language of this certification be included in the award documents for all sub-awards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by 31 U.S.C. § 1352. Any person who fails to file the required certification shall be subject to a civil penalty of not less than $10,000 and not more than $100,000 for each such failure.

A17 OCCUPATIONAL SAFETY AND HEALTH ACT OF 1970

SOURCE: 29 CFR Part 1910

All contracts and subcontracts that result from this solicitation incorporate by reference the requirements of 29 CFR Part 1910 with the same force and effect as if given in full text. The employer must provide a work environment that is free from recognized hazards that may cause death or serious physical harm to the employee. The employer retains full responsibility to monitor its compliance and their subcontractor's compliance with the applicable requirements of the Occupational Safety and Health Act of 1970 (29 CFR Part 1910). The employer must address any claims or disputes that pertain to a referenced requirement directly with the U.S. Department of Labor – Occupational Safety and Health Administration.

A18 PROCUREMENT OF RECOVERED MATERIALS

SOURCE: 2 CFR § 200.323; 2 CFR Part 200, Appendix II(J); 40 CFR Part 247; 42 USC § 6901, et seq (Resource Conservation and Recovery Act (RCRA))

Contractor and subcontractor agree to comply with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, and the regulatory provisions of 40 CFR Part 247. In the performance of this contract and to the extent practicable, the Contractor and subcontractors are to use products containing the highest percentage of recovered materials for items designated by the Environmental Protection Agency (EPA) under 40 CFR Part 247 whenever:

1) The contract requires procurement of $10,000 or more of a designated item during the fiscal year; or

2) The contractor has procured $10,000 or more of a designated item using Federal funding during the previous fiscal year.

The list of EPA-designated items is available at www.epa.gov/smm/comprehensive-procurement-guidelines-construction-products.

Section 6002(c) establishes exceptions to the preference for recovery of EPA-designated products if the contractor can demonstrate the item is:

a) Not reasonably available within a timeframe providing for compliance with the contract performance schedule;
b) Fails to meet reasonable contract performance requirements; or
c) Is only available at an unreasonable price.

A19 RIGHT TO INVENTIONS

SOURCE: 2 CFR Part 200, Appendix II(F); 37 CFR Part 401

Not Applicable

A20 SEISMIC SAFETY

SOURCE: 49 CFR Part 41

Not Applicable

A21 TAX DELINQUENCY AND FELONY CONVICTIONS

SOURCE: Section 8113 of the Consolidated Appropriations Act, 2022 (P.L. 117-103) and similar provisions in subsequent appropriations acts. DOT Order 4200.6 – Appropriations Act Requirements for Procurement and Non-Procurement Regarding Tax Delinquency and Felony Convictions

CERTIFICATION OF OFFEROR/BIDDER REGARDING TAX DELINQUENCY AND FELONY CONVICTIONS

The applicant must complete the following two certification statements. The applicant must indicate its current status as it relates to tax delinquency and felony conviction by inserting a checkmark (ü) in the space following the applicable response. The applicant agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification in all lower tier subcontracts.

Certifications – *this certification is included in the proposal forms to be submitted with bid.*

1) The applicant represents that it is (ü) is not (ü) a corporation that has any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

2) The applicant represents that it is (ü) is not (ü) a corporation that was convicted of a criminal violation under any Federal law within the preceding 24 months.

Note

If an applicant responds in the affirmative to either of the above representations, the applicant is ineligible to receive an award unless the Sponsor has received notification from the agency suspension and debarment official (SDO) that the SDO has considered suspension or debarment and determined that further action is not required to protect the Government's interests. The applicant therefore must provide information to the owner about its tax liability or conviction to the Owner, who will then notify the FAA Airports District Office, which will then notify the agency's SDO to facilitate completion of the required considerations before award decisions are made.

Term Definitions

Felony conviction: Felony conviction means a conviction within the preceding twenty four (24) months of a felony criminal violation under any Federal law and includes conviction of an offense defined in a section of the U.S. Code that specifically classifies the offense as a felony and conviction of an offense that is classified as a felony under 18 USC § 3559.

Tax Delinquency: A tax delinquency is any unpaid Federal tax liability that has been assessed, for which all judicial and administrative remedies have been exhausted, or have lapsed, and that is not being paid in a timely manner pursuant to an agreement with the authority responsible for collecting the tax liability.

A22 TERMINATION OF CONTRACT

SOURCE: 2 CFR Part 200, Appendix II(B) FAA Advisory Circular 150/5370-10, Section 80-09

TERMINATION FOR CONVENIENCE (CONSTRUCTION & EQUIPMENT CONTRACTS)

The Owner may terminate this contract in whole or in part at any time by providing written notice to the Contractor. Such action may be without cause and without prejudice to any other right or remedy of Owner. Upon receipt of a written notice of termination, except as explicitly directed by the Owner, the Contractor shall immediately proceed with the following obligations regardless of any delay in determining or adjusting amounts due under this clause:

1. Contractor must immediately discontinue work as specified in the written notice.
2. Terminate all subcontracts to the extent they relate to the work terminated under the notice.
3. Discontinue orders for materials and services except as directed by the written notice.
4. Deliver to the Owner all fabricated and partially fabricated parts, completed and partially completed work, supplies, equipment and materials acquired prior to termination of the work, and as directed in the written notice.
5. Complete performance of the work not terminated by the notice.
6. Take action as directed by the Owner to protect and preserve property and work related to this contract that Owner will take possession.

Owner agrees to pay Contractor for:

1. Completed and acceptable work executed in accordance with the contract documents prior to the effective date of termination;
2. Documented expenses sustained prior to the effective date of termination in performing work and furnishing labor, materials, or equipment as required by the contract documents in connection with uncompleted work;
3. Reasonable and substantiated claims, costs, and damages incurred in settlement of terminated contracts with Subcontractors and Suppliers; and
4. Reasonable and substantiated expenses to the Contractor directly attributable to Owner's termination action.

Owner will not pay Contractor for loss of anticipated profits or revenue or other economic loss arising out of or resulting from the Owner's termination action.

The rights and remedies this clause provides are in addition to any other rights and remedies provided by law or under this contract.

TERMINATION FOR CAUSE (CONSTRUCTION)

Section 80-09 of FAA Advisory Circular 150/5370-10 establishes standard language for conditions, rights, and remedies associated with Owner termination of this contract for cause due to default of the Contractor.

TERMINATION FOR CAUSE (EQUIPMENT)

The Owner may, by written notice of default to the Contractor, terminate all or part of this Contract for cause if the Contractor:

1. Fails to begin the Work under the Contract within the time specified in the Notice- to-Proceed;
2. Fails to make adequate progress as to endanger performance of this Contract in accordance with its terms;
3. Fails to make delivery of the equipment within the time specified in the Contract, including any Owner approved extensions;
4. Fails to comply with material provisions of the Contract;
5. Submits certifications made under the Contract and as part of their proposal that include false or fraudulent statements; or
6. Becomes insolvent or declares bankruptcy.

If one or more of the stated events occur, the Owner will give notice in writing to the Contractor and Surety of its intent to terminate the contract for cause. At the Owner's discretion, the notice may allow the Contractor and Surety an opportunity to cure the breach or default.

If within [10] days of the receipt of notice, the Contractor or Surety fails to remedy the breach or default to the satisfaction of the Owner, the Owner has authority to acquire equipment by other procurement action. The Contractor will be liable to the Owner for any excess costs the Owner incurs for acquiring such similar equipment.

Payment for completed equipment delivered to and accepted by the Owner shall be at the Contract price. The Owner may withhold from amounts otherwise due the Contractor for such completed equipment, such sum as the Owner determines to be necessary to protect the Owner against loss because of Contractor default.

Owner will not terminate the Contractor's right to proceed with the work under this clause if the delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such acceptable causes include: acts of God, acts of the Owner, acts of another Contractor in the performance of a contract with the Owner, and severe weather events that substantially exceed normal conditions for the location.

If, after termination of the Contractor's right to proceed, the Owner determines that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the Owner issued the termination for the convenience the Owner.

The rights and remedies of the Owner in this clause are in addition to any other rights and remedies provided by law or under this contract.

A23 TRADE RESTRICTION CERTIFICATION

SOURCE: 49 USC § 50104; 49 CFR Part 30

TRADE RESTRICTION CERTIFICATION

By submission of an offer, the Offeror certifies that with respect to this solicitation and any resultant contract, the Offeror –

1) is not owned or controlled by one or more citizens of a foreign country included in the list of countries that discriminate against U.S. firms as published by the Office of the United States Trade Representative (USTR);

2) has not knowingly entered into any contract or subcontract for this project with a person that is a citizen or national of a foreign country included on the list of countries that discriminate against U.S. firms as published by the USTR; and

3) has not entered into any subcontract for any product to be used on the Federal project that is produced in a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR.

This certification concerns a matter within the jurisdiction of an agency of the United States of America and the making of a false, fictitious, or fraudulent certification may render the maker subject to prosecution under Title 18 USC § 1001.

The Offeror/Contractor must provide immediate written notice to the Owner if the Offeror/Contractor learns that its certification or that of a subcontractor was erroneous when submitted or has become erroneous by reason of changed circumstances. The Contractor must require subcontractors provide immediate written notice to the Contractor if at any time it learns that its certification was erroneous by reason of changed circumstances.

Unless the restrictions of this clause are waived by the Secretary of Transportation in accordance with 49 CFR § 30.17, no contract shall be awarded to an Offeror or subcontractor:

1) who is owned or controlled by one or more citizens or nationals of a foreign country included on the list of countries that discriminate against U.S. firms published by the USTR; or
2) whose subcontractors are owned or controlled by one or more citizens or nationals of a foreign country on such USTR list; or
3) who incorporates in the public works project any product of a foreign country on such USTR list.

Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render, in good faith, the certification required by this provision. The knowledge and information of a contractor is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.

The Offeror agrees that, if awarded a contract resulting from this solicitation, it will incorporate this provision for certification without modification in all lower tier subcontracts. The Contractor may rely on the certification of a prospective subcontractor that it is not a firm from a foreign country included on the list of countries that discriminate against U.S. firms as published by USTR, unless the Offeror has knowledge that the certification is erroneous.

This certification is a material representation of fact upon which reliance was placed when making an award. If it is later determined that the Contractor or subcontractor knowingly rendered an erroneous certification, the Federal Aviation Administration (FAA) may direct through the Owner cancellation of the contract or subcontract for default at no cost to the Owner or the FAA.

A24 VETERAN'S PREFERENCE

SOURCE: 49 USC § 47112(c)

In the employment of labor (excluding executive, administrative, and supervisory positions), the Contractor and all sub-tier contractors must give preference to covered veterans as defined within 49 U.S.C. § 47112. Covered veterans include Vietnam-era veterans, Persian Gulf veterans, Afghanistan-

Iraq war veterans, disabled veterans, and small business concerns (as defined by 15 U.S.C. § 632) owned and controlled by disabled veterans. This preference only applies when there are covered veterans readily available and qualified to perform the work to which the employment relates.

A25 DOMESTIC PREFERENCES FOR PROCUREMENTS

SOURCE: 2 CFR § 200.322; 2 CFR Part 200, Appendix II(L)

Must be included in all subawards, including all contracts and purchase orders for work or products under the grant.

CERTIFICATION REGARDING DOMESTIC PREFERENCES FOR PROCUREMENTS

The Bidder or Offeror certifies by signing and submitting this bid or proposal that, to the greatest extent practicable, the Bidder or Offeror has provided a preference for the purchase, acquisition, or use of goods, products, or materials produced in the United States (including, but not limited to, iron, aluminum, steel, cement, and other manufactured products) in compliance with 2 CFR § 200.322.

A26 PROHIBITION OF COVERED UNMANNED AIRCRAFT SYSTEMS (UAS)

SOURCE: FAA Reauthorization Act of 2024 (Public Law 118-63), Section 936; 49 U.S.C. § 44801 note

Sponsors and subgrant recipients are prohibited from using AIP grant funds to enter into, extend, or renew a contract for:

1) *The operation, procurement, or contracting action with respect to a covered unmanned aircraft system (UAS); or*
2) *To any entity that operates a covered unmanned aircraft system (UAS) in the performance of such contract.*

The term "Covered UAS" means a small unmanned aircraft, an unmanned aircraft, and unmanned aircraft system, or the associated elements of such aircraft and aircraft systems related to the collection and transmission of sensitive information (consisting of communication links and the components that control the unmanned aircraft) that enable the operator to operate the aircraft in the National Airspace System which is manufactured or assembled by a covered foreign entity; and an unmanned aircraft detection system or counter- UAS system that is manufactured or assembled by a covered foreign entity. These covered foreign entities include:

(a) The People's Republic of China.
(b) The Russian Federation.
(c) The Islamic Republic of Iran.
(d) The Democratic People's Republic of Korea.
(e) The Bolivarian Republic of Venezuela.
(f) The Republic of Cuba.
(g) Any other country the Secretary determines necessary.

Include the following provision in all AIP-funded contracts and lower-tier contracts:

The Bidder or Offeror certifies that they are aware of and comply with relevant Federal statutes and regulations, including those from the Federal Aviation Administration (FAA), for operating unmanned aircraft systems (UAS) in accordance, and in compliance with all related requirements in the FAA Reauthorization Act of 2024 (Public Law 118-63), section 936 (49 U.S.C. § 44801 note).

Contractor warrants that all UAS operations will be conducted in full compliance with all applicable Federal Aviation Administration (FAA) regulations, including but not limited to 14 CFR Part 107, and any other applicable local, state, or Federal laws and regulations.

Sponsors and subgrant recipients cannot use AIP grant funds to enter into, extend, or renew a contract related to covered unmanned aircraft systems (UAS). This includes both procurement and operational contracts, as well as contracts with entities that operate such systems.

END OF FEDERAL CONTRACT PROVISIONS

SPECIAL PROVISIONS

1. BID PROTEST PROCEDURE

The following criteria shall be met in order to dispute the bid for this project:

- The protest shall include the name, street address, electronic mail address, and telephone number of the protester. All protested/disputed item(s) shall be detailed in writing and include justification or grounds for protest.
- If a protester formally disputes the procurement because the bid solicitation is allegedly defective, the protest shall be submitted in writing to both the Sponsor and Engineer no later than 7 calendar days prior to the bid due date and time. Late submittal of a protest regarding improper bid solicitations may result in rejection of the protest without action by the Sponsor.
- If a protester formally disputes award of the project because of alleged improper bid evaluation, the protest shall be submitted in writing to both the Sponsor and Engineer no later than 14 calendar days following the issuance of the Recommendation to Award.
- Formal protests shall be submitted in writing to each of the following locations. Protests must be received by the established deadlines with no exceptions.

Sponsor:	Engineer:
Mr. Jose Saavedra, Airport Director	Mr. Leigh Bartlett PE
Bangor International Airport	Mead & Hunt, Inc.
287 Godfrey Blvd	75 Washington Avenue, Suite 202
Bangor, ME 04401	Portland, ME 04101

The Sponsor will respond in detail to each substantive issue raised by a formal protest submitted in strict accordance with these written requirements. Items addressed by addenda subsequent to a bid protest that address the protested item(s) will not be allowed to be considered for dispute. A protest or specific protest allegations may be dismissed any time sufficient information is obtained by the Sponsor warranting dismissal. The Sponsor's determination is final. FAA will only entertain protests that involve (1) a violation of Federal laws or regulations and/or (2) allegations that the Sponsor's written protest procedures were not followed.

2. FREEDOM OF ACCESS ACT (FOAA).

Under Maine's Freedom of Access Act, all records in possession of the City and related to the transaction of its business are public, unless designated as confidential, privileged, or otherwise exempt by law. Accordingly, any documents you submit may be available to the public.

3. COMPLIANCE WITH LAWS.

The bidder/contractor is assumed to be familiar with and agrees to observe and comply with all Federal, State and local laws, statutes, ordinances and regulations. The bidder shall fully indemnify, save harmless and protect the City, their successors, assigns, agents, customers, affiliates, agents and employees against any loss, claim liability damage, and expense arising from the bidder's actual or alleged noncompliance with such laws and regulations. The specifications will identify permits that have been obtained by the Owner, Architect, or Engineer. If the permit is not specifically identified the contract documents the Contractor shall assume the permit has not been obtained. Further, The Contractor shall procure all permits and licenses, pay all charges, fees, and taxes, and give all notices necessary and incidental to the due and lawful execution of the work in accordance with Section 70-02 of the General Provisions.

4. TIE BIDS

Tie Bids shall be resolved by the flip of a coin. Such tie breaking procedures shall be performed by the Purchasing Agent in the presence of one or more witnesses and reported to the Finance Committee.

5. "OR EQUAL" CLAUSE

Whenever a material, article or piece of equipment is identified on the plans or in the specification by reference to manufacturer's or vendor's names, trade names, catalogue numbers, etc., it is intended merely to establish a standard; and, other material, article, or equipment of other manufacturers and vendors which will perform adequately the duties imposed by the general design will be considered equally acceptable provided the material, article, or equipment so proposed, is, in the opinion of the RPR, of equal substance and function. It shall not be purchased or installed by the Contractor without the RPR's written approval. Reference section 60-03 of the General Provisions for further details.

6. INSURANCE REQUIREMENTS

In consideration of the utilization of Contractor's services by the City of Bangor and other valuable considerations, the receipt of which is hereby acknowledged, Contractor agrees that all persons furnished by Contractor shall be considered the Contractor's employees or agents and that Contractor shall be responsible for payment of all unemployment, social security and other payroll taxes including contributions from them when required by law.

CONTRACTOR hereby agrees to protect, defend, indemnify and hold the Owner and Architect/Engineer and their respective employees, agents, officers and servants free and harmless from any and all losses, claims, liens, demands and causes of action of every kind and character including but not limited to, the amounts of judgments, penalties, interests, court costs, legal fees and all other expenses incurred by the Owner and Architect/Engineer arising in favor of any party, including claims, liens, debts, personal injuries, including employees of the Owner or Architect/Engineer death or damages to property (including property of the Owner, Authority or Architect/Engineer) and without limitation by enumeration, all other claims or demands of every character occurring or in any way incident to, in connection with or arising or directly indirectly out of this Contractor Agreement. CONTRACTOR agrees to investigate, handle, respond to, provide defense for and defend any such claims, demands or suits at the sole handle, of the CONTRACTOR. CONTRACTOR also agrees to bear all other costs and expense related thereto, even if the claim or claims alleged are groundless, false or fraudulent. This provision is not intended to create any cause of action in favor of any third party against Contractor or the City or to enlarge in any way the CONTRACTOR'S liability but is intended solely to provide for indemnification of the City from liability for damages or injuries to third persons or property arising from CONTRACTOR'S performance hereunder.

CONTRACTOR agrees to maintain in full force and effect:

a) Comprehensive General Liability insurance written on occurrence form, including completed operations coverage, personal injury liability coverage, broad form property damage liability coverage, XCU coverage and contractual liability coverage insuring the agreements contained herein. The minimum limits of liability carried on such insurance shall be $5,000,000 each occurrence and, where applicable, in the aggregate combined single limit for bodily injury and property damage liability; $5,000,000 annual aggregate personal injury liability.

b) Automobile liability insurance for owned, non-owned and hired vehicles. The minimum limit of liability carried on such insurance shall be $1,000,000 each accident, combined single limits for bodily injury and property damage. The City of Bangor must be listed as a Certificate Holder on the policy.

c) Workers' Compensation insurance whether or not required by Maine Statute, with statutory coverage and including employer's liability insurance.

a. Worker's Compensation Insurance — Statutory
b. Employer's Liability Insurance — $500,000 each accident
   1. $500,000 disease – policy unit
   2. $500,000 disease – each empl.

c. The CONTRACTOR herby expressly agrees that he/she will defend, indemnify and hold the OWNER harmless from any and all claims made or asserted by the CONTRACTOR'S agents, servants or employees arising out of the CONTRACTOR's activities under this CONTRACT. For this purpose, the CONTRACTOR herby expressly waives any and all immunity he/she may have under Maine's Workers Compensation Act in regard to such claims made or asserted by the CONTRACTOR's agents, servants, or employees.

d) Any and all deductibles on the above described insurance policies shall be assumed by and be for the account of, and at the sole risk of contractor.

e) Insurance companies utilized must be admitted to do business in Maine or be on the Insurance Commissioner's list of approved non-admitted companies and shall have a rating of (A) or better in the current edition of Best's Key Rating Guide.

f) CONTRACTOR agrees to furnish certificate(s) of the above mentioned insurance to the Owner within fourteen (14) days from the date of this agreement and, with respect to the renewals of the current insurance policies, at least thirty (30) days in advance of each renewal date. Such certificates shall, with respect to comprehensive general liability and auto liability insurance, name the Owner, Architect/Engineer firms designated by Owner as an additional insured (except workers' compensation) and, with respect to all policies shall state that in the event of cancellation or material change, written notice shall be given to the Owner at least thirty (30) days in advance of such cancellation or change.

g) The purchase of the insurance required or the famishing of the aforesaid certificate shall not be a satisfaction of CONTRACTOR'S liability hereunder or in any way modify the CONTRACTOR'S indemnification responsibilities to the Owner or Architect/Engineers.

h) It shall be the responsibility of CONTRACTOR to ensure that all subcontractors comply with the same insurance requirements that he is required to meet.

SPECIAL HAZARDS

The Contractor's and Subcontractor's Public Liability, Property Damage, Vehicle Liability, and Vehicle Property Damage insurance coverages shall provide adequate protection against the following special hazards

1. Damage or injury to aircraft or persons in aircraft operating on or near the project site,resulting from any operations under this Contract.
2. Damage or injury resulting from the use, storage, handling or transportation of explosives in connection with the Contract work.

BASIS OF PAYMENT

No direct payment will be made for insurance. The cost thereof shall be included in the cost of the pay items.

7. TAXES

The Contractor shall include, and will be deemed to have included, in its bid and contract price all applicable Maine taxes which have been enacted into law as of the date the bid is submitted.

Because the Owner holds a Tax Exemption Certificate, all or a portion of the materials purchased for the project may be exempt from Maine Sales Tax. It is the bidder's responsibility to determine which purchases are eligible for tax exemption in accordance with Maine State Law. The bidder shall be responsible for filing all necessary paperwork to receive the exemption. The Owner may provide the necessary documentation show its tax exempt status.

The City of Bangor's Exemption details are:

Permanent Exemption Certificate Number:	E81590
Federal Identification Number:	016000020

To the extent of any conflict, this Special provision controls over Section 70-01 of the General Provisions.

8. GENERAL REQUIREMENTS FOR PARTICIPATION BY DISADVANTAGED BUSINESS ENTERPRISES (DBE) IN DEPARTMENT OF TRANSPORTATION PROGRAMS

OBJECTIVES/POLICY STATEMENT

The City of Bangor, Maine has established a Disadvantaged Business Enterprise (DBE) program in accordance with regulations of the U.S. Department of Transportation (DOT), 49 CFR Part 26. The City of Bangor has received Federal financial assistance from the Department of Transportation for airport projects through the Federal Aviation Administration's (FAA) Airport Improvement Program (AIP), and as a condition of receiving this assistance, the City of Bangor has signed an assurance that it will comply with 49 CFR Part 26. It is the policy of the City of Bangor to ensure that DBEs, as defined in Part 26, have an equal opportunity to receive and participate in DOT-assisted contracts.

It is our policy to:

1. To ensure nondiscrimination in the award and administration of DOT assisted contracts;
2. To create a level playing field on which DBEs can compete fairly for DOT assisted contracts;
3. To ensure that the DBE Program is narrowly tailored in accordance with applicable law;
4. To ensure that only firms that fully meet 49 CFR Part 26 eligibility standards are permitted to participate as DBEs;
5. To help remove barriers to the participation of DBEs in DOT assisted contracts; and
6. To assist the development of firms that can compete successfully in the market place outside the DBE Program.

CONTRACT REQUIREMENTS

The bidder/contractors shall take all necessary and reasonable steps in accordance with 49 CFR Part 26 to ensure that disadvantaged business enterprises have the maximum opportunity to compete for and perform contracts. The City of Bangor and their contractors shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of DOT assisted contracts.
The bidder/contractor shall make good faith efforts, as defined in Appendix A of 49 CFR Part 26, Regulations of the Office of the Secretary of Transportation, to subcontract **zero (0)percent** of the dollar value of the prime contract to small business concerns owned and controlled by socially and economically disadvantaged individuals (DBE). In the event that the bidder (prime contractor) for this solicitation qualifies as a DBE, the contract goal shall be deemed to have been met.

Each bidder/contractor is required to submit information concerning the DBE's that will participate in the contract. The information will include the name and address of each DBE, a description of the work to be performed by each named firm, and the dollar value of the contract. Written documentation of the bidder/offeror's commitment to use a DBE subcontractor whose participation it submits to meet the contract goal as well as written confirmation from the DBE that it is participating in the contract will be submitted.

If the bidder/contractor fails to achieve the contract goal stated herein, it will be required to provide documentation demonstrating that it made good faith efforts in attempting to do so.

COMPLIANCE
All bidders, contractors, or subcontractors for this FAA assisted contract are hereby notified that failure to carry out the policy and the DBE obligation, as set forth above, shall constitute a breach of contract which may result in termination of the contract, debarment, or such other remedy as deemed appropriate by the City or FAA.

FINAL DBE PARTICIPATION STATEMENT.
The Contractor shall submit a statement showing the final accounting of all DBE participation actually used in the execution of the work prior to the final acceptance of the project. Should the actual DBE participation be less than the contract goals and/or contractor's assurance submitted with the bid proposal, than the Contractor shall provide written documentation of their good faith effort to achieve the goal per the requirements of the Bangor international Airport DBE Plan.

9. PAYMENTS

Payment shall be made in accordance with Section 90 of the General Provisions.

Pay applications will include the following:

- An acceptable Payment Request form in general conformance with the format of AIA Documents G702 & G703
- Affidavit of Payment from the Contractor stating that all subcontractors and suppliers have been paid for all for the previous payments received.
- DBE expenditure report for the period covered.

10. CERTIFIED PAYROLLS

Certified weekly payrolls covering the contractor's and all subcontractor's work forces shall be submitted to the RPR along with Weekly Employment and OJT Report on all federally funded projects, except these requirements shall not apply to any contract of $2,000 or less, or airport sponsor negotiated projects in accordance with CFR 29, Part 3

Each contractor or subcontractor engaged in the construction, prosecution, completion, or repair of any public building or public work, or building or work financed in whole or in part by loans or grants from the United States, each week must provide a copy of its weekly payroll for all laborers and mechanics engaged on work covered by this part and part 5 of this chapter during the preceding weekly payroll period, accompanied by a statement of compliance certifying the accuracy of the weekly payroll information. This statement must be executed by the contractor or subcontractor or by an authorized officer or employee of the contractor or subcontractor who supervises the payment of wages, and must be on the back of Form WH-347, "Payroll (For Contractors Optional Use)" or on any form with identical wording. Copies of WH-347 may be obtained from the contracting or sponsoring agency or from the Wage and Hour Division website at *https://www.dol.gov/agencies/whd/government-contracts/construction/forms* or its successor site. The signature by the contractor, subcontractor, or the authorized officer or employee must be an original handwritten signature or a legally valid electronic signature

These requirements are supplemental to other required contract provisions carried in this bid proposal.

11. CONTRACTOR BADGE RULES

All contractors should allow for at least 1-2 weeks of processing time to meet the access requirements below. Please contact the Airport Compliance Office to arrange the processing of vehicles and employees. Badge Applications all badge and training information can be found at https://flybangor.com/badge-office/

A. A fingerprint-based criminal history records check must be performed for each employee requiring unescorted access within the secure area (Lead Agents, Supervisors, Special Technicians, or anyone who must work alone). All others must be under constant supervision by a badge holder.
    I. Two valid I-9 type documents are required for this process. No expired documents or copies of documents
    II. People found to have disqualifying events in their background check will not be allowed within the airport perimeter even under escort.
    III. All badges must be issued within 30 days of the completion of the background check, or a new check must be completed.
    IV. All higher-level security badges require annual retraining. Failure to complete annual retraining will invalidate your badge, and your access to the Airport.
    V. Initial training is computer based and must be completed on site, under observation
    VI. All badge holders needing to operate a vehicle within the airport perimeter are required to take the appropriate ramp driving course. This course will familiarize the badge holder with the airport security requirements, airport layout, and the proper airport radio use.

B. The fee for I.D. cards and renewals is posted in the website at https://flybangor.com/badge-office/. This fee covers the cost of fingerprinting the contractor and creating the card.

C. The vehicle registration and proof of 1 million dollars liability insurance will be submitted to the Compliance office for each vehicle that requires access to the Aircraft Operation Areas (AOA). Each vehicle will either be marked with a large company logo on each side, or the vehicle will be issued an individually numbered ramp permit, which will be displayed on the right rear bumper. Vehicles without signs or permits will be escorted off the ramp area. A properly marked vehicle with a trained driver may escort an unmarked vehicle with an untrained driver.

D. Only those with the fingerprint background check may escort others and only those with driver training may drive.

E. Failure to return Airport property, badges, keys, or other equipment will result in various invoices from the City of Bangor. Some of these invoices are simply to replace the item but some include the cost of reprogramming items to replace the one that was damaged or not returned. You will receive a $200 invoice from the City of Bangor if you do not return our badge when your contract is complete. If the $200 invoice is not paid promptly the $200 will be deducted from contract payments.

END OF SECTION

Part 5

Technical Specifications

Item C-100 Contractor Quality Control Program (CQCP)

100-1 General. Quality is more than test results. Quality is the combination of proper materials, testing, workmanship, equipment, inspection, and documentation of the project. Establishing and maintaining a culture of quality is key to achieving a quality project. The Contractor shall establish, provide, and maintain an effective Contractor Quality Control Program (CQCP) that details the methods and procedures that will be taken to assure that all materials and completed construction required by this contract conform to contract plans, technical specifications and other requirements, whether manufactured by the Contractor, or procured from subcontractors or vendors. Although guidelines are established and certain minimum requirements are specified here and elsewhere in the contract technical specifications, the Contractor shall assume full responsibility for accomplishing the stated purpose.

The Contractor shall establish a CQCP that will:

a. Provide qualified personnel to develop and implement the CQCP.

b. Provide for the production of acceptable quality materials.

c. Provide sufficient information to assure that the specification requirements can be met.

d. Document the CQCP process.

The Contractor shall not begin any construction or production of materials to be incorporated into the completed work until the CQCP has been reviewed and approved by the Resident Project Representative (RPR). No partial payment will be made for materials subject to specific quality control (QC) requirements until the CQCP has been reviewed and approved.

The QC requirements contained in this section and elsewhere in the contract technical specifications are in addition to and separate from the quality assurance (QA) testing requirements. QA testing requirements are the responsibility of the RPR or Contractor as specified in the specifications.

A Quality Control (QC)/Quality Assurance (QA) workshop with the Engineer, Resident Project Representative (RPR), Contractor, subcontractors, testing laboratories, and Owner's representative must be held prior to start of construction. The QC/QA workshop will be facilitated by the Contractor. The Contractor shall coordinate with the Airport and the RPR on time and location of the QC/QA workshop. Items to be addressed, at a minimum, will include:

a. Review of the CQCP including submittals, QC Testing, Action & Suspension Limits for Production, Corrective Action Plans, Distribution of QC reports, and Control Charts.

b. Discussion of the QA program.

c. Discussion of the QC and QA Organization and authority including coordination and information exchange between QC and QA.

d. Establish regular meetings to discuss control of materials, methods and testing.

e. Establishment of the overall QC culture.

100-2 Description of program.

a. General description. The Contractor shall establish a CQCP to perform QC inspection and testing of all items of work required by the technical specifications, including those performed by subcontractors. The CQCP shall ensure conformance to applicable specifications and plans with respect to materials, off-

site fabrication, workmanship, construction, finish, and functional performance. The CQCP shall be effective for control of all construction work performed under this Contract and shall specifically include surveillance and tests required by the technical specifications, in addition to other requirements of this section and any other activities deemed necessary by the Contractor to establish an effective level of QC.

b. Contractor Quality Control Program (CQCP). The Contractor shall describe the CQCP in a written document that shall be reviewed and approved by the RPR prior to the start of any production, construction, or off-site fabrication. The written CQCP shall be submitted to the RPR for review and approval at least 10 calendar days before the CQCP Workshop. The Contractor's CQCP and QC testing laboratory must be approved in writing by the RPR prior to the Notice to Proceed (NTP).

The CQCP shall be organized to address, as a minimum, the following:

1. QC organization and resumes of key staff
2. Project progress schedule
3. Submittals schedule
4. Inspection requirements
5. QC testing plan
6. Documentation of QC activities and distribution of QC reports
7. Requirements for corrective action when QC and/or QA acceptance criteria are not met
8. Material quality and construction means and methods. Address all elements applicable to the project that affect the quality of the pavement structure including subgrade, subbase, base, and surface course. Some elements that must be addressed include, but is not limited to mix design, aggregate grading, stockpile management, mixing and transporting, placing and finishing, quality control testing and inspection, smoothness, laydown plan, equipment, and temperature management plan.

The Contractor must add any additional elements to the CQCP that is necessary to adequately control all production and/or construction processes required by this contract.

100-3 CQCP organization. The CQCP shall be implemented by the establishment of a QC organization. An organizational chart shall be developed to show all QC personnel, their authority, and how these personnel integrate with other management/production and construction functions and personnel.

The organizational chart shall identify all QC staff by name and function, and shall indicate the total staff required to implement all elements of the CQCP, including inspection and testing for each item of work. If necessary, different technicians can be used for specific inspection and testing functions for different items of work. If an outside organization or independent testing laboratory is used for implementation of all or part of the CQCP, the personnel assigned shall be subject to the qualification requirements of paragraphs 100-03a and 100-03b. The organizational chart shall indicate which personnel are Contractor employees and which are provided by an outside organization.

The QC organization shall, as a minimum, consist of the following personnel:

a. Program Administrator. The Contractor Quality Control Program Administrator (CQCPA) must be a full-time on-site employee of the Contractor, or a consultant engaged by the Contractor. The CQCPA must have a minimum of five (5) years of experience in QC pavement construction with prior QC experience on a project of comparable size and scope as the contract.

Included in the five (5) years of paving/QC experience, the CQCPA must meet at least one of the following requirements:

(1) Professional Engineer with one (1) year of airport paving experience.

(2) Engineer-in-training with two (2) years of airport paving experience.

(3) National Institute for Certification in Engineering Technologies (NICET) Civil Engineering Technology Level IV with three (3) years of airport paving experience.

(4) An individual with four (4) years of airport paving experience, with a Bachelor of Science Degree in Civil Engineering, Civil Engineering Technology or Construction.

The CQCPA must have full authority to institute any and all actions necessary for the successful implementation of the CQCP to ensure compliance with the contract plans and technical specifications. The CQCPA authority must include the ability to immediately stop production until materials and/or processes are in compliance with contract specifications. The CQCPA must report directly to a principal officer of the construction firm. The CQCPA may supervise the Quality Control Program on more than one project provided that person can be at the job site within two (2) hours after being notified of a problem.

b. QC technicians. A sufficient number of QC technicians necessary to adequately implement the CQCP must be provided. These personnel must be either Engineers, engineering technicians, or experienced craftsman with qualifications in the appropriate field equivalent to NICET Level II in Civil Engineering Technology or higher, and shall have a minimum of two (2) years of experience in their area of expertise.

The QC technicians must report directly to the CQCPA and shall perform the following functions:

(1) Inspection of all materials, construction, plant, and equipment for conformance to the technical specifications, and as required by paragraph 100-6.

(2) Performance of all QC tests as required by the technical specifications and paragraph100-8.

(3) Performance of tests for the RPR when required by the technical specifications.

Certification at an equivalent level of qualification and experience by a state or nationally recognized organization will be acceptable in lieu of NICET certification.

c. Staffing levels. The Contractor shall provide sufficient qualified QC personnel to monitor each work activity at all times. Where material is being produced in a plant for incorporation into the work, separate plant and field technicians shall be provided at each plant and field placement location. The scheduling and coordinating of all inspection and testing must match the type and pace of work activity. The CQCP shall state where different technicians will be required for different work elements.

100-4 Project progress schedule. Critical QC activities must be shown on the project schedule as required by Section 80, paragraph 80-03, *Execution and Progress*.

100-5 Submittals schedule. The Contractor shall submit a detailed listing of all submittals (for example, mix designs, material certifications) and shop drawings required by the technical specifications. The listing can be developed in a spreadsheet format and shall include as a minimum:

a. Specification item number

b. Item description

c. Description of submittal

d. Specification paragraph requiring submittal

e. Scheduled date of submittal

100-6 Inspection requirements. QC inspection functions shall be organized to provide inspections for all definable features of work, as detailed below. All inspections shall be documented by the Contractor as specified by paragraph 100-9.

Inspections shall be performed as needed to ensure continuing compliance with contract requirements until completion of the particular feature of work. Inspections shall include the following minimum requirements:

a. During plant operation for material production, QC test results and periodic inspections shall be used to ensure the quality of aggregates and other mix components, and to adjust and control mix proportioning to meet the approved mix design and other requirements of the technical specifications. All equipment used in proportioning and mixing shall be inspected to ensure its proper operating condition. The CQCP shall detail how these and other QC functions will be accomplished and used.

b. During field operations, QC test results and periodic inspections shall be used to ensure the quality of all materials and workmanship. All equipment used in placing, finishing, and compacting shall be inspected to ensure its proper operating condition and to ensure that all such operations are in conformance to the technical specifications and are within the plan dimensions, lines, grades, and tolerances specified. The CQCP shall document how these and other QC functions will be accomplished and used.

100-7 Contractor QC testing facility.

a. For projects that include Item P-401, Item P-403, and Item P-404, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM D3666, *Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials*:

8.1.3 Equipment Calibration and Checks;

8.1.9 Equipment Calibration, Standardization, and Check Records;

8.1.12 Test Methods and Procedures

b. For projects that include P-501, the Contractor shall ensure facilities, including all necessary equipment, materials, and current reference standards, are provided that meet requirements in the following paragraphs of ASTM C1077, Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation:

7 Test Methods and Procedures

8 Facilities, Equipment, and Supplemental Procedures

100-8 QC testing plan. As a part of the overall CQCP, the Contractor shall implement a QC testing plan, as required by the technical specifications. The testing plan shall include the minimum tests and test frequencies required by each technical specification Item, as well as any additional QC tests that the Contractor deems necessary to adequately control production and/or construction processes.

The QC testing plan can be developed in a spreadsheet fashion and shall, as a minimum, include the following:

a. Specification item number (e.g., P-401)

b. Item description (e.g., Hot Mix Asphalt Pavements)

c. Test type (e.g., gradation, grade, asphalt content)

d. Test standard (e.g., ASTM or American Association of State Highway and Transportation Officials (AASHTO) test number, as applicable)

e. Test frequency (e.g., as required by technical specifications or minimum frequency when requirements are not stated)

f. Responsibility (e.g., plant technician)

g. Control requirements (e.g., target, permissible deviations)

The QC testing plan shall contain a statistically-based procedure of random sampling for acquiring test samples in accordance with ASTM D3665. The RPR shall be provided the opportunity to witness QC sampling and testing.

All QC test results shall be documented by the Contractor as required by paragraph 100-9.

100-9 Documentation. The Contractor shall maintain current QC records of all inspections and tests performed. These records shall include factual evidence that the required QC inspections or tests have been performed, including type and number of inspections or tests involved; results of inspections or tests; nature of defects, deviations, causes for rejection, etc.; proposed remedial action; and corrective actions taken.

These records must cover both conforming and defective or deficient features, and must include a statement that all supplies and materials incorporated in the work are in full compliance with the terms of the contract. Legible copies of these records shall be furnished to the RPR daily. The records shall cover all work placed subsequent to the previously furnished records and shall be verified and signed by the CQCPA.

Contractor QC records required for the contract shall include, but are not necessarily limited to, the following records:

a. Daily inspection reports. Each Contractor QC technician shall maintain a daily log of all inspections performed for both Contractor and subcontractor operations. These technician's daily reports shall provide factual evidence that continuous QC inspections have been performed and shall, as a minimum, include the following:

(1) Technical specification item number and description

(2) Compliance with approved submittals

(3) Proper storage of materials and equipment

(4) Proper operation of all equipment

(5) Adherence to plans and technical specifications

(6) Summary of any necessary corrective actions

(7) Safety inspection.

(8) Photographs and/or video

The daily inspection reports shall identify all QC inspections and QC tests conducted, results of inspections, location and nature of defects found, causes for rejection, and remedial or corrective actions taken or proposed.

The daily inspection reports shall be signed by the responsible QC technician and the CQCPA. The RPR shall be provided at least one copy of each daily inspection report on the work day following the day of record. When QC inspection and test results are recorded and transmitted electronically, the results must be archived.

b. Daily test reports. The Contractor shall be responsible for establishing a system that will record all QC test results. Daily test reports shall document the following information:

(1) Technical specification item number and description

(2) Test designation

(3) Location

(4) Date of test

(5) Control requirements

(6) Test results
(7) Causes for rejection
(8) Recommended remedial actions
(9) Retests

Test results from each day's work period shall be submitted to the RPR prior to the start of the next day's work period. When required by the technical specifications, the Contractor shall maintain statistical QC charts. When QC daily test results are recorded and transmitted electronically, the results must be archived.

100-10 Corrective action requirements. The CQCP shall indicate the appropriate action to be taken when a process is deemed, or believed, to be out of control (out of tolerance) and detail what action will be taken to bring the process into control. The requirements for corrective action shall include both general requirements for operation of the CQCP as a whole, and for individual items of work contained in the technical specifications.

The CQCP shall detail how the results of QC inspections and tests will be used for determining the need for corrective action and shall contain clear rules to gauge when a process is out of control and the type of correction to be taken to regain process control.

When applicable or required by the technical specifications, the Contractor shall establish and use statistical QC charts for individual QC tests. The requirements for corrective action shall be linked to the control charts.

100-11 Inspection and/or observations by the RPR. All items of material and equipment are subject to inspection and/or observation by the RPR at the point of production, manufacture or shipment to determine if the Contractor, producer, manufacturer or shipper maintains an adequate QC system in conformance with the requirements detailed here and the applicable technical specifications and plans. In addition, all items of materials, equipment and work in place shall be subject to inspection and/or observation by the RPR at the site for the same purpose.

Inspection and/or observations by the RPR does not relieve the Contractor of performing QC inspections of either on-site or off-site Contractor's or subcontractor's work.

100-12 Noncompliance.

a. The Resident Project Representative (RPR) will provide written notice to the Contractor of any noncompliance with their CQCP. After receipt of such notice, the Contractor must take corrective action.

b. When QC activities do not comply with either the CQCP or the contract provisions or when the Contractor fails to properly operate and maintain an effective CQCP, and no effective corrective actions have been taken after notification of non-compliance, the RPR will recommend the Owner take the following actions:

(1) Order the Contractor to replace ineffective or unqualified QC personnel or subcontractors and/or

(2) Order the Contractor to stop operations until appropriate corrective actions are taken.

METHOD OF MEASUREMENT

100-13 Basis of measurement and payment. Contractor Quality Control Program (CQCP) is for the personnel, tests, facilities and documentation required to implement the CQCP. The CQCP will be paid as a lump sum with the following schedule of partial payments:

a. With first pay request, 25% with approval of CQCP and completion of the Quality Control (QC)/Quality Assurance (QA) workshop.

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 20%.

d. When 75% or more of the original contract is earned, an additional 20%

e. After final inspection and acceptance of project, the final 10%.

BASIS OF PAYMENT

100-14 Payment will be made under:

Item C-100-5.1	Contractor Quality Control Program (CQCP**)** 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.

National Institute for Certification in Engineering Technologies (NICET)

ASTM International (ASTM)

ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials

END OF ITEM C-100

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.

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 Temporary erosion and pollution control work required will be performed as scheduled or directed by the RPR. Completed and accepted work will be measured as follows:

a. Temporary seeding and mulching will be measured by the square yard (square meter).

b. Temporary slope drains will be measured by the linear foot (meter).

c. Temporary benches, dikes, dams, and sediment basins will be measured by the cubic yard (cubic meter) of excavation performed, including necessary cleaning of sediment basins, and the cubic yard (cubic meter) of embankment placed as directed by the RPR.

d. All fertilizing will be measured by the ton (kg).

e. Installation and removal of silt fence will be measured by the linear foot (meter).

f. Installation and removal if inlet protection will be measured by each.

g. Temporary check dams will be measured by the linear foot (meter).

102-4.2 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

102-5.1 Accepted quantities of temporary water pollution, soil erosion, and siltation control work ordered by the RPR and measured as provided in paragraph 102-4.1 will be paid for under:

Item C-102-5.1	Installation and Removal of Inlet Protection - per each
Item C-102-5.2	Installation and Removal of Silt Fence - per linear foot
Item C-102-5.3	Installation and Removal of Temporary Check Dam - per linear foot

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. The Contractor shall provide dedicated space for the use of the field RPR and inspectors, as a field office for the duration of the project. This space shall be located conveniently near the construction and shall be separate from any space used by the Contractor. The Contractor shall furnish water, sanitary facilities, heat, air conditioning, and electricity in accordance with local building codes.

METHOD OF MEASUREMENT

105-6.1 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-105-5.1 Mobilization – 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 C-110 Method of Estimating Percentage of Material Within Specification Limits (PWL)

110-1 General. When the specifications provide for acceptance of material based on the method of estimating percentage of material within specification limits (PWL), the PWL will be determined in accordance with this section. All test results for a lot will be analyzed statistically to determine the total estimated percent of the lot that is within specification limits. The PWL is computed using the sample average (X) and sample standard deviation (S_n) of the specified number (n) of sublots for the lot and the specification tolerance limits, L for lower and U for upper, for the particular acceptance parameter. From these values, the respective Quality index, Q_L for Lower Quality Index and/or Q_U for Upper Quality Index, is computed and the PWL for the lot for the specified n is determined from Table 1. All specification limits specified in the technical sections shall be absolute values. Test results used in the calculations shall be to the significant figure given in the test procedure.

There is some degree of uncertainty (risk) in the measurement for acceptance because only a small fraction of production material (the population) is sampled and tested. This uncertainty exists because all portions of the production material have the same probability to be randomly sampled. The Contractor's risk is the probability that material produced at the acceptable quality level is rejected or subjected to a pay adjustment. The Owner's risk is the probability that material produced at the rejectable quality level is accepted.

It is the intent of this section to inform the Contractor that, in order to consistently offset the Contractor's risk for material evaluated, production quality (using population average and population standard deviation) must be maintained at the acceptable quality specified or higher. In all cases, it is the responsibility of the Contractor to produce at quality levels that will meet the specified acceptance criteria when sampled and tested at the frequencies specified.

110-2 Method for computing PWL. The computational sequence for computing PWL is as follows:

a. Divide the lot into n sublots in accordance with the acceptance requirements of the specification.

b. Locate the random sampling position within the sublot in accordance with the requirements of the specification.

c. Make a measurement at each location, or take a test portion and make the measurement on the test portion in accordance with the testing requirements of the specification.

d. Find the sample average (X) for all sublot test values within the lot by using the following formula:

$$\mathbf{X = (x_1 + x_2 + x_3 + \ldots x_n) / n}$$

Where: X = Sample average of all sublot test values within a lot

$x_1, x_2, \ldots x_n$ = Individual sublot test values

n = Number of sublot test values

e. Find the sample standard deviation (S_n) by use of the following formula:

$$S_n = [(d_1^2 + d_2^2 + d_3^2 + \ldots d_n^2)/(n-1)]^{1/2}$$

Where: S_n = Sample standard deviation of the number of sublot test values in the set

$d_1, d_2, \ldots d_n$ = Deviations of the individual sublot test values $x_1, x_2, \ldots$ from the average value X

that is: $d_1 = (x_1 - X)$, $d_2 = (x_2 - X) \ldots d_n = (x_n - X)$

n = Number of sublot test values

f. For single sided specification limits (i.e., L only), compute the Lower Quality Index Q_L by use of the following formula:

$$Q_L = (X - L) / S_n$$

Where: L = specification lower tolerance limit

Estimate the percentage of material within limits (PWL) by entering Table 1 with Q_L, using the column appropriate to the total number (n) of measurements. If the value of Q_L falls between values shown on the table, use the next higher value of PWL.

g. For double-sided specification limits (i.e., L and U), compute the Quality Indexes Q_L and Q_U by use of the following formulas:

$$Q_L = (X - L) / S_n$$
and
$$Q_U = (U - X) / S_n$$

Where: L and U = specification lower and upper tolerance limits

Estimate the percentage of material between the lower (L) and upper (U) tolerance limits (PWL) by entering Table 1 separately with Q_L and Q_U, using the column appropriate to the total number (n) of measurements, and determining the percent of material above P_L and percent of material below P_U for each tolerance limit. If the values of Q_L fall between values shown on the table, use the next higher value of P_L or P_U. Determine the PWL by use of the following formula:

$$PWL = (P_U + P_L) - 100$$

Where: P_L = percent within lower specification limit

P_U = percent within upper specification limit

EXAMPLE OF PWL CALCULATION

Project: Example Project

Test Item: Item P-401, Lot A.

A. PWL Determination for Mat Density.

1. Density of four random cores taken from Lot A.

A-1 = 96.60

A-2 = 97.55
A-3 = 99.30
A-4 = 98.35
n = 4

2. Calculate average density for the lot.

$X = (x_1 + x_2 + x_3 + . . . x_n) / n$
$X = (96.60 + 97.55 + 99.30 + 98.35) / 4$
$X = 97.95\%$ density

3. Calculate the standard deviation for the lot.

$S_n = [((96.60 - 97.95)^2 + (97.55 - 97.95)^2 + (99.30 - 97.95)^2 + (98.35 - 97.95)^2)) / (4 - 1)]^{1/2}$
$S_n = [(1.82 + 0.16 + 1.82 + 0.16) / 3]^{1/2}$
$S_n = 1.15$

4. Calculate the Lower Quality Index Q_L for the lot. (L=96.3)

$Q_L = (X - L) / S_n$
$Q_L = (97.95 - 96.30) / 1.15$
$Q_L = 1.4348$

5. Determine PWL by entering Table 1 with $Q_L = 1.44$ and n= 4.

PWL = 98

B. PWL Determination for Air Voids.

1. Air Voids of four random samples taken from Lot A.

A-1 = 5.00
A-2 = 3.74
A-3 = 2.30
A-4 = 3.25

2. Calculate the average air voids for the lot.

$X = (x_1 + x_2 + x_3 . . . n) / n$
$X = (5.00 + 3.74 + 2.30 + 3.25) / 4$
$X = 3.57\%$

3. Calculate the standard deviation S_n for the lot.

$S_n = [((3.57 - 5.00)^2 + (3.57 - 3.74)^2 + (3.57 - 2.30)^2 + (3.57 - 3.25)^2) / (4 - 1)]^{1/2}$
$S_n = [(2.04 + 0.03 + 1.62 + 0.10) / 3]^{1/2}$
$S_n = 1.12$

4. Calculate the Lower Quality Index Q_L for the lot. (L= 2.0)

$Q_L = (X - L) / S_n$
$Q_L = (3.57 - 2.00) / 1.12$
$Q_L = 1.3992$

5. Determine P_L by entering Table 1 with $Q_L = 1.41$ and n = 4.

$P_L = 97$

6. Calculate the Upper Quality Index Q_U for the lot. (U= 5.0)

$Q_U = (U - X) / S_n$

$Q_U = (5.00 - 3.57) / 1.12$

$Q_U = 1.2702$

7. Determine P_U by entering Table 1 with $Q_U = 1.29$ and n = 4.

$P_U = 93$

8. Calculate Air Voids PWL

$PWL = (P_L + P_U) - 100$

$PWL = (97 + 93) - 100 = 90$

EXAMPLE OF OUTLIER CALCULATION (REFERENCE ASTM E178)

Project: Example Project

Test Item: Item P-401, Lot A.

A. Outlier Determination for Mat Density.

1. Density of four random cores taken from Lot A arranged in descending order.

A-3 = 99.30

A-4 = 98.35

A-2 = 97.55

A-1 = 96.60

2. From ASTM E178, Table 1, for n=4 an upper 5% significance level, the critical value for test criterion = 1.463.

3. Use average density, standard deviation, and test criterion value to evaluate density measurements.

a. For measurements greater than the average:

If (measurement - average)/(standard deviation) is less than test criterion, then the measurement is not considered an outlier.

For A-3, check if (99.30 - 97.95) / 1.15 is greater than 1.463.

Since 1.174 is less than 1.463, the value is not an outlier.

b. For measurements less than the average:

If (average - measurement)/(standard deviation) is less than test criterion, then the measurement is not considered an outlier.

For A-1, check if (97.95 - 96.60) / 1.15 is greater than 1.463.

Since 1.435 is less than 1.463, the value is not an outlier.

Note: In this example, a measurement would be considered an outlier if the density were:

Greater than (97.95 + 1.463 × 1.15) = 99.63%

OR

less than (97.95 - 1.463 × 1.15) = 96.27%.

Table 1. Table for Estimating Percent of Lot Within Limits (PWL)

Percent Within Limits (P_L and P_U)	Positive Values of Q (Q_L and Q_U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
99	1.1541	1.4700	1.6714	1.8008	1.8888	1.9520	1.9994	2.0362
98	1.1524	1.4400	1.6016	1.6982	1.7612	1.8053	1.8379	1.8630
97	1.1496	1.4100	1.5427	1.6181	1.6661	1.6993	1.7235	1.7420
96	1.1456	1.3800	1.4897	1.5497	1.5871	1.6127	1.6313	1.6454
95	1.1405	1.3500	1.4407	1.4887	1.5181	1.5381	1.5525	1.5635
94	1.1342	1.3200	1.3946	1.4329	1.4561	1.4717	1.4829	1.4914
93	1.1269	1.2900	1.3508	1.3810	1.3991	1.4112	1.4199	1.4265
92	1.1184	1.2600	1.3088	1.3323	1.3461	1.3554	1.3620	1.3670
91	1.1089	1.2300	1.2683	1.2860	1.2964	1.3032	1.3081	1.3118
90	1.0982	1.2000	1.2290	1.2419	1.2492	1.2541	1.2576	1.2602
89	1.0864	1.1700	1.1909	1.1995	1.2043	1.2075	1.2098	1.2115
88	1.0736	1.1400	1.1537	1.1587	1.1613	1.1630	1.1643	1.1653
87	1.0597	1.1100	1.1173	1.1192	1.1199	1.1204	1.1208	1.1212
86	1.0448	1.0800	1.0817	1.0808	1.0800	1.0794	1.0791	1.0789
85	1.0288	1.0500	1.0467	1.0435	1.0413	1.0399	1.0389	1.0382
84	1.0119	1.0200	1.0124	1.0071	1.0037	1.0015	1.0000	0.9990
83	0.9939	0.9900	0.9785	0.9715	0.9671	0.9643	0.9624	0.9610
82	0.9749	0.9600	0.9452	0.9367	0.9315	0.9281	0.9258	0.9241
81	0.9550	0.9300	0.9123	0.9025	0.8966	0.8928	0.8901	0.8882
80	0.9342	0.9000	0.8799	0.8690	0.8625	0.8583	0.8554	0.8533
79	0.9124	0.8700	0.8478	0.8360	0.8291	0.8245	0.8214	0.8192
78	0.8897	0.8400	0.8160	0.8036	0.7962	0.7915	0.7882	0.7858
77	0.8662	0.8100	0.7846	0.7716	0.7640	0.7590	0.7556	0.7531
76	0.8417	0.7800	0.7535	0.7401	0.7322	0.7271	0.7236	0.7211
75	0.8165	0.7500	0.7226	0.7089	0.7009	0.6958	0.6922	0.6896
74	0.7904	0.7200	0.6921	0.6781	0.6701	0.6649	0.6613	0.6587
73	0.7636	0.6900	0.6617	0.6477	0.6396	0.6344	0.6308	0.6282
72	0.7360	0.6600	0.6316	0.6176	0.6095	0.6044	0.6008	0.5982
71	0.7077	0.6300	0.6016	0.5878	0.5798	0.5747	0.5712	0.5686
70	0.6787	0.6000	0.5719	0.5582	0.5504	0.5454	0.5419	0.5394
69	0.6490	0.5700	0.5423	0.5290	0.5213	0.5164	0.5130	0.5105
68	0.6187	0.5400	0.5129	0.4999	0.4924	0.4877	0.4844	0.4820
67	0.5878	0.5100	0.4836	0.4710	0.4638	0.4592	0.4560	0.4537
66	0.5563	0.4800	0.4545	0.4424	0.4355	0.4310	0.4280	0.4257
65	0.5242	0.4500	0.4255	0.4139	0.4073	0.4030	0.4001	0.3980
64	0.4916	0.4200	0.3967	0.3856	0.3793	0.3753	0.3725	0.3705
63	0.4586	0.3900	0.3679	0.3575	0.3515	0.3477	0.3451	0.3432
62	0.4251	0.3600	0.3392	0.3295	0.3239	0.3203	0.3179	0.3161
61	0.3911	0.3300	0.3107	0.3016	0.2964	0.2931	0.2908	0.2892
60	0.3568	0.3000	0.2822	0.2738	0.2691	0.2660	0.2639	0.2624
59	0.3222	0.2700	0.2537	0.2461	0.2418	0.2391	0.2372	0.2358
58	0.2872	0.2400	0.2254	0.2186	0.2147	0.2122	0.2105	0.2093
57	0.2519	0.2100	0.1971	0.1911	0.1877	0.1855	0.1840	0.1829
56	0.2164	0.1800	0.1688	0.1636	0.1607	0.1588	0.1575	0.1566
55	0.1806	0.1500	0.1406	0.1363	0.1338	0.1322	0.1312	0.1304
54	0.1447	0.1200	0.1125	0.1090	0.1070	0.1057	0.1049	0.1042
53	0.1087	0.0900	0.0843	0.0817	0.0802	0.0793	0.0786	0.0781
52	0.0725	0.0600	0.0562	0.0544	0.0534	0.0528	0.0524	0.0521
51	0.0363	0.0300	0.0281	0.0272	0.0267	0.0264	0.0262	0.0260
50	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Percent Within Limits (P_L and P_U)	Negative Values of Q (Q_L and Q_U)							
	n=3	n=4	n=5	n=6	n=7	n=8	n=9	n=10
49	-0.0363	-0.0300	-0.0281	-0.0272	-0.0267	-0.0264	-0.0262	-0.0260
48	-0.0725	-0.0600	-0.0562	-0.0544	-0.0534	-0.0528	-0.0524	-0.0521
47	-0.1087	-0.0900	-0.0843	-0.0817	-0.0802	-0.0793	-0.0786	-0.0781
46	-0.1447	-0.1200	-0.1125	-0.1090	-0.1070	-0.1057	-0.1049	-0.1042
45	-0.1806	-0.1500	-0.1406	-0.1363	-0.1338	-0.1322	-0.1312	-0.1304
44	-0.2164	-0.1800	-0.1688	-0.1636	-0.1607	-0.1588	-0.1575	-0.1566
43	-0.2519	-0.2100	-0.1971	-0.1911	-0.1877	-0.1855	-0.1840	-0.1829
42	-0.2872	-0.2400	-0.2254	-0.2186	-0.2147	-0.2122	-0.2105	-0.2093
41	-0.3222	-0.2700	-0.2537	-0.2461	-0.2418	-0.2391	-0.2372	-0.2358
40	-0.3568	-0.3000	-0.2822	-0.2738	-0.2691	-0.2660	-0.2639	-0.2624
39	-0.3911	-0.3300	-0.3107	-0.3016	-0.2964	-0.2931	-0.2908	-0.2892
38	-0.4251	-0.3600	-0.3392	-0.3295	-0.3239	-0.3203	-0.3179	-0.3161
37	-0.4586	-0.3900	-0.3679	-0.3575	-0.3515	-0.3477	-0.3451	-0.3432
36	-0.4916	-0.4200	-0.3967	-0.3856	-0.3793	-0.3753	-0.3725	-0.3705
35	-0.5242	-0.4500	-0.4255	-0.4139	-0.4073	-0.4030	-0.4001	-0.3980
34	-0.5563	-0.4800	-0.4545	-0.4424	-0.4355	-0.4310	-0.4280	-0.4257
33	-0.5878	-0.5100	-0.4836	-0.4710	-0.4638	-0.4592	-0.4560	-0.4537
32	-0.6187	-0.5400	-0.5129	-0.4999	-0.4924	-0.4877	-0.4844	-0.4820
31	-0.6490	-0.5700	-0.5423	-0.5290	-0.5213	-0.5164	-0.5130	-0.5105
30	-0.6787	-0.6000	-0.5719	-0.5582	-0.5504	-0.5454	-0.5419	-0.5394
29	-0.7077	-0.6300	-0.6016	-0.5878	-0.5798	-0.5747	-0.5712	-0.5686
28	-0.7360	-0.6600	-0.6316	-0.6176	-0.6095	-0.6044	-0.6008	-0.5982
27	-0.7636	-0.6900	-0.6617	-0.6477	-0.6396	-0.6344	-0.6308	-0.6282
26	-0.7904	-0.7200	-0.6921	-0.6781	-0.6701	-0.6649	-0.6613	-0.6587
25	-0.8165	-0.7500	-0.7226	-0.7089	-0.7009	-0.6958	-0.6922	-0.6896
24	-0.8417	-0.7800	-0.7535	-0.7401	-0.7322	-0.7271	-0.7236	-0.7211
23	-0.8662	-0.8100	-0.7846	-0.7716	-0.7640	-0.7590	-0.7556	-0.7531
22	-0.8897	-0.8400	-0.8160	-0.8036	-0.7962	-0.7915	-0.7882	-0.7858
21	-0.9124	-0.8700	-0.8478	-0.8360	-0.8291	-0.8245	-0.8214	-0.8192
20	-0.9342	-0.9000	-0.8799	-0.8690	-0.8625	-0.8583	-0.8554	-0.8533
19	-0.9550	-0.9300	-0.9123	-0.9025	-0.8966	-0.8928	-0.8901	-0.8882
18	-0.9749	-0.9600	-0.9452	-0.9367	-0.9315	-0.9281	-0.9258	-0.9241
17	-0.9939	-0.9900	-0.9785	-0.9715	-0.9671	-0.9643	-0.9624	-0.9610
16	-1.0119	-1.0200	-1.0124	-1.0071	-1.0037	-1.0015	-1.0000	-0.9990
15	-1.0288	-1.0500	-1.0467	-1.0435	-1.0413	-1.0399	-1.0389	-1.0382
14	-1.0448	-1.0800	-1.0817	-1.0808	-1.0800	-1.0794	-1.0791	-1.0789
13	-1.0597	-1.1100	-1.1173	-1.1192	-1.1199	-1.1204	-1.1208	-1.1212
12	-1.0736	-1.1400	-1.1537	-1.1587	-1.1613	-1.1630	-1.1643	-1.1653
11	-1.0864	-1.1700	-1.1909	-1.1995	-1.2043	-1.2075	-1.2098	-1.2115
10	-1.0982	-1.2000	-1.2290	-1.2419	-1.2492	-1.2541	-1.2576	-1.2602
9	-1.1089	-1.2300	-1.2683	-1.2860	-1.2964	-1.3032	-1.3081	-1.3118
8	-1.1184	-1.2600	-1.3088	-1.3323	-1.3461	-1.3554	-1.3620	-1.3670
7	-1.1269	-1.2900	-1.3508	-1.3810	-1.3991	-1.4112	-1.4199	-1.4265
6	-1.1342	-1.3200	-1.3946	-1.4329	-1.4561	-1.4717	-1.4829	-1.4914
5	-1.1405	-1.3500	-1.4407	-1.4887	-1.5181	-1.5381	-1.5525	-1.5635
4	-1.1456	-1.3800	-1.4897	-1.5497	-1.5871	-1.6127	-1.6313	-1.6454
3	-1.1496	-1.4100	-1.5427	-1.6181	-1.6661	-1.6993	-1.7235	-1.7420
2	-1.1524	-1.4400	-1.6016	-1.6982	-1.7612	-1.8053	-1.8379	-1.8630
1	-1.1541	-1.4700	-1.6714	-1.8008	-1.8888	-1.9520	-1.9994	-2.0362

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 E178 Standard Practice for Dealing with Outlying Observations

END OF ITEM C-110

Item D-705 Pipe Underdrains for Airports

DESCRIPTION

705-1.1 This item shall consist of the construction of pipe drains in accordance with these specifications and in reasonably close conformity with the lines and grades shown on the plans.

MATERIALS

705-2.1 General. Materials shall meet the requirements shown on the plans and specified below.

705-2.2 Pipe. The pipe shall be of the type called for on the plans or in the proposal and shall be in accordance with the following appropriate requirements.

AASHTO M252 Standard Specification for Corrugated Polyethylene Drainage Pipe

705-2.3 Joint mortar. Pipe joint mortar shall consist of one part by volume of Portland cement and two parts sand. The Portland cement shall conform to the requirements of ASTM C150, Type I. The sand shall conform to the requirements of ASTM C144.

705-2.4 Elastomeric seals. Elastomeric seals shall conform to the requirements of ASTM F477.

705-2.5 Porous backfill. Porous backfill shall be free of clay, humus, or other objectionable matter, and shall conform to the gradation in Table 1 when tested in accordance with ASTM C136.

Table 1. Gradation of Porous Backfill

Sieve Designation (square openings)	Percentage by Weight Passing Sieves
	Porous Material No. *
1-1/2 inch (37.5 mm)	100
1 inch (25.0 mm)	90-100
3/8 inch (9.5 mm)	25-60
No. 4 (4.75 mm)	5-40
No. 8 (2.36 mm)	0-20
No. 16 (1.18 mm)	*
No. 50 (300 µm)	*
No. 100 (150 µm)	*

When two courses of porous backfill are specified in the plans, the finer of the materials shall conform to particle size tabulated herein for porous material No. 1. The coarser granular material shall meet the gradation given in the tabulation for porous material No. 2.

705-2.6 Granular material. Granular material used for backfilling shall conform to the requirements of ASTM D2321 for Class IA, IB, or II materials.

705-2.7 Filter fabric. The filter fabric shall conform to the requirements of AASHTO M288 Class 2 or equivalent.

Table 2. Fabric Properties

Fabric Property	Test Method	Test Requirement
Grab Tensile Strength, lbs	ASTM D4632	125 min
Grab Tensile Elongation %	ASTM D4632	50 min
Burst Strength, psi	ASTM D3785	125 min
Trapezoid Tear Strength, lbs	ASTM D4533	55 min
Puncture Strength, lbs	ASTM D4833	40 min
Abrasion, lbs	ASTM D4886	15 max loss
Equivalent Opening Size	ASTM D4751	70-100
Permittivity sec^{-1}	ASTM D4491	0.80
Accelerated Weathering (UV Stability) (Strength Retained - %)	ASTM D4355 *(500 hrs exposure)	70

705-2.8 Controlled low-strength material (CLSM). CLSM is not used

CONSTRUCTION METHODS

705-3.1 Equipment. All equipment required for the construction of pipe underdrains shall be on the project, in good working condition, and approved by the RPR before construction is permitted to start.

705-3.2 Excavation. The width of the pipe trench shall be sufficient to permit satisfactory jointing of the pipe and thorough tamping of the bedding material under and around the pipe, but shall not be less than the external diameter of the pipe plus 6 inches (150 mm) on each side of the pipe. The trench walls shall be approximately vertical.

Where rock, hardpan, or other unyielding material is encountered, it shall be removed below the foundation grade for a depth of at least 4 inches (100 mm). The excavation below grade shall be backfilled with selected fine compressible material, such as silty clay or loam, and lightly compacted in layers not over 6 inches (150 mm) in uncompacted depth to form a uniform but yielding foundation.

Where a firm foundation is not encountered at the grade established, due to soft, spongy, or other unstable soil, the unstable soil shall be removed and replaced with approved granular material for the full trench width. The RPR shall determine the depth of removal necessary. The granular material shall be compacted to provide adequate support for the pipe.

Excavated material not required or acceptable for backfill shall be disposed of by the Contractor as directed by the RPR. The excavation shall not be carried below the required depth; if this occurs, the trench shall be backfilled at the Contractor's expense with material approved by the RPR and compacted to the density of the surrounding material.

The pipe bedding shall be constructed uniformly over the full length of the pipe barrel, as required on the plans. The maximum aggregate size shall be 1 inch when the bedding thickness is less than 6 inches, and 1-1/2 inch when the bedding thickness is greater than 6 inches. Bedding shall be loosely placed, uncompacted material under the middle third of the pipe prior to placement of the pipe.

The Contractor shall do trench bracing, sheathing, or shoring necessary to perform and protect the excavation as required for safety and conformance to federal, state and local laws. Unless otherwise provided, the bracing, sheathing, or shoring shall be removed by the Contractor after the backfill has reached at least 12 inches (300 mm) over the top of the pipe. The sheathing or shoring shall be pulled as the granular backfill is placed and compacted to avoid any unfilled spaces between the trench wall and the backfill material. The cost of bracing, sheathing, or shoring, and the removal of same, shall be included in the unit price bid per foot (meter) for the pipe.

705-3.3 Laying and installing pipe.

a. Concrete pipe. The laying of the pipe in the finished trench shall be started at the lowest point and proceed upgrade. When bell and spigot pipe is used, the bells shall be laid upgrade. If tongue and groove pipe is used, the groove end shall be laid upgrade. Holes in perforated pipe shall be placed down, unless otherwise shown on the plans. The pipe shall be firmly and accurately set to line and grade so that the invert will be smooth and uniform. Pipe shall not be laid on frozen ground.

Pipe which is not true in alignment, or which shows any settlement after laying, shall be taken up and re-laid by the Contractor at no additional expense. Making adjustments in grade by exerting force on the barrel of the pipe with excavating equipment, by lifting and dropping the pipe, or by lifting the pipe and packing bedding material under it shall be prohibited. If the installed pipe section is not to grade, the pipe section shall be completely removed, the grade corrected, and the pipe rejoined."

b. Metal pipe. The metal pipe shall be laid with the separate sections joined firmly together with bands, with outside laps of circumferential joints pointing upgrade, and with longitudinal laps on the sides. Any metal in the pipe or bands that is not protected thoroughly by galvanizing shall be coated with a suitable asphaltum paint.

During installation, the asphalt-protected pipe shall be handled without damaging the asphalt coating. Any breaks in the bitumen or treatment of the pipe shall be refilled with the type and kind of bitumen used in coating the pipe originally.

c. PVC, fiberglass, or polyethylene pipe. PVC or polyethylene pipe shall be installed in accordance with the requirements of ASTM D2321. Perforations shall meet the requirements of AASHTO M252 or AASHTO M294 Class 2, unless otherwise indicated on the plans. The pipe shall be laid accurately to line and grade. Fiberglass per ASTM D3839 Standard Guide for Underground Installation of "Fiberglass" (Glass-Fiber Reinforced Thermosetting-Resin) Pipe.

d. All types of pipe. The upgrade end of pipelines, not terminating in a structure, shall be plugged or capped as approved by the RPR.

Unless otherwise shown on the plans, a 4-inch (100 mm) bed of granular backfill material shall be spread in the bottom of the trench throughout the entire length under all perforated pipe underdrains.

Pipe outlets for the underdrains shall be constructed when required or shown on the plans. The pipe shall be laid with tight-fitting joints. Porous backfill is not required around or over pipe outlets for underdrains. All connections to other drainage pipes or structures shall be made as required and in a satisfactory manner. If connections are not made to other pipes or structures, the outlets shall be protected and constructed as shown on the plans.

e. Filter fabric. The filter fabric shall be installed in accordance with the manufacturer's recommendations, or in accordance with the AASHTO M288 Appendix, unless otherwise shown on the plans.

705-3.4 Mortar. The mortar shall be of the desired consistency for caulking and filling the joints of the pipe and for making connections to other pipes or to structures. Mortar that is not used within 45 minutes after water has been added shall be discarded. Retempering of mortar shall not be permitted.

705-3.5 Joints in concrete pipe. When open or partly open joints are required or specified, they shall be constructed as indicated on the plans. The pipe shall be laid with the ends fitted together as designed. If bell and spigot pipe is used, mortar shall be placed along the inside bottom quarter of the bell to center the following section of pipe.

The open or partly open joints shall be surrounded with granular material meeting requirements of porous backfill No. 2 in Table 1 or as indicated on the plans. This backfill shall be placed so its thickness will be not less than 3 inches (75 mm) nor more than 6 inches (150 mm), unless otherwise shown on the plans.

When the original material excavated from the trench is impervious, commercial concrete sand or granular material meeting requirements of porous backfill No. 1 shall surround porous backfill No. 2 (Table 1), as shown on the plans or as directed by the RPR.

When the original material excavated from the trench is pervious and suitable, it may be used as backfill in lieu of porous backfill No. 1, when indicated on the plans or as directed by the RPR.

705-3.6 Embedment and Backfill

a. Earth. All trenches and excavations shall be backfilled soon after the pipes are installed, unless additional protection of the pipe is directed. The embedment material shall be select material from excavation or borrow and shall be approved by the RPR. The select material shall be placed on each side of the pipe out to a distance of the nominal pipe diameter and one foot (30 cm) over the top of the pipe and shall be readily compacted. It shall not contain stones 3 inches (75 mm) or larger in size, frozen lumps, chunks of highly plastic clay, or any other material that is objectionable to the RPR. The material shall be moistened or dried, as required to aid compaction. Placement of the embedment material shall not cause displacement of the pipe. Thorough compaction under the haunches and along the sides to the top of the pipe shall be obtained.

The embedment material shall be placed in loose layers not exceeding 6 inches (150 mm) in depth under and around the pipe. Backfill material over the pipe shall be placed in lifts not exceeding 8 inches (200 mm). Successive layers shall be added and thoroughly compacted by hand and pneumatic tampers, approved by the RPR, until the trench is completely filled and brought to the planned elevation. Embedment and backfilling shall be done to avoid damaging top or side of the pipe.

In embankments and other unpaved areas, the backfill shall be compacted per Item P-152 to the density required for embankments in unpaved areas. Under paved areas, the subgrade and any backfill shall be compacted per Item P-152 to the density required for embankments for paved areas.

b. Granular backfill. When granular backfill is required, placement in the trench and about the pipe shall be as shown on the plans. The granular backfill shall not contain an excessive amount of foreign matter, nor shall soil from the sides of the trench or from the soil excavated from the trench be allowed to filter into the granular backfill. When required by the RPR, a template shall be used to properly place and separate the two sizes of backfill. The backfill shall be placed in loose layers not exceeding 6 inches (150 mm) in depth. The granular backfill shall be compacted by hand and pneumatic tampers to the requirements as given for embankment. Backfilling shall be done to avoid damaging top or side pressure on the pipe. The granular backfill shall extend to the elevation of the trench or as shown on the plans.

When perforated pipe is specified, granular backfill material shall be placed along the full length of the pipe. The position of the granular material shall be as shown on the plans. If the original material excavated from the trench is pervious and suitable, it shall be used in lieu of porous backfill No. 1.

If porous backfill is placed in paved or adjacent to paved areas before grading or subgrade operations is completed, the backfill material shall be placed immediately after laying the pipe. The depth of the granular backfill shall be not less than 12 inches (300 mm), measured from the top of the underdrain. During subsequent construction operations, a minimum depth of 12 inches (300 mm) of backfill shall be maintained over the underdrains. When the underdrains are to be completed, any unsuitable material shall

be removed exposing the porous backfill. Porous backfill containing objectionable material shall be removed and replaced with suitable material. The cost of removing and replacing any unsuitable material shall be at the Contractor's expense.

If a granular subbase blanket course is used which extends several feet beyond the edge of paving to the outside edge of the underdrain trench, the granular backfill material over the underdrains shall be placed in the trench up to an elevation of 2 inches (50 mm) above the bottom surface of the granular subbase blanket course. Immediately prior to the placing of the granular subbase blanket course, the Contractor shall blade this excess trench backfill from the top of the trench onto the adjacent subgrade where it can be incorporated into the granular subbase blanket course. Any unsuitable material that remains over the underdrain trench shall be removed and replaced. The subbase material shall be placed to provide clean contact between the subbase material and the underdrain granular backfill material for the full width of the underdrain trench.

c. Controlled low-strength material (CLSM). CLSM is not used

705-3.7 Flexible Pipe Ring Deflection. The flexible pipe shall be inspected by the Contractor during and after installation to ensure that the internal diameter of the pipe barrel has not been reduced by more than 5 percent. For guidance on properly sizing mandrels, refer to ASTM D3034 and ASTM F679 appendices.

705-3.8Connections. When the plans call for connections to existing or proposed pipe or structures, these connections shall be watertight and made to obtain a smooth uniform flow line throughout the drainage system.

705-3.9 Cleaning and restoration of site. After the backfill is completed, the Contractor shall dispose of all surplus material, soil, and rubbish from the site. Surplus soil may be deposited in embankments, shoulders, or as directed by the RPR. Except for paved areas of the airport, the Contractor shall restore all disturbed areas to their original condition.

METHOD OF MEASUREMENT

705-4.1 The length of pipe shall be the number of linear feet (meters) of pipe underdrains in place, completed, and approved; measured along the centerline of the pipe from end or inside face of structure to the end or inside face of structure, whichever is applicable. The several classes, types, and sizes shall be measured separately. All fittings shall be included in the footage as typical pipe sections in the pipeline being measured.

705-4.2 The quantity of pipe underdrains shall be made at the contract unit price per linear foot (meter) complete, including porous backfill and filter fabric.

705-4.3 The quantity of pipe underdrains cleanouts shall be made at the contract unit price per each cleanout in place, complete, and accepted.

BASIS OF PAYMENT

705-5.1 Payment for Pipe underdrains, shall be made at the contract unit price per linear foot (meter) complete.

705-5.1 Payment for Pipe underdrains, complete (including porous backfill and filter fabric) shall be made at the contract unit price per linear foot (meter) complete (including porous backfill and filter fabric.

705-5.2 Payment will be made at the contract unit price each for underdrain cleanout of the type specified in plans.

These prices shall be full compensation for furnishing all materials and for all preparation, excavation, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item D-705-5.1	6 Inch, Perforated Underdrain, Complete – per linear foot
Item D-705-5.2	Underdrain Cleanout – per each
Item D-705-5.3	Underdrain Connection to Stormwater – per each
Item D-705-5.4	Remove and Replace and Adjust Existing Cleanout Frame and Cover – per each
Item D-705-5.5	Underdrain Rip Rap Apron Outlet – per each

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 A760	Standard Specification for Corrugated Steel Pipe, Metallic Coated for Sewers and Drains
ASTM A762	Standard Specification for Corrugated Steel Pipe, Polymer Precoated for Sewers and Drains
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C444	Standard Specification for Perforated Concrete Pipe
ASTM C654	Standard Specification for Porous Concrete Pipe
ASTM D2321	Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications
ASTM D3262	Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting Resin) Sewer Pipe
ASTM D4161	Standard Specification for "Fiberglass" (Glass-Fiber Reinforced Thermosetting Resin) Pipe Joints Using Flexible Elastomeric Seals

ASTM F477	Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
ASTM F758	Standard Specification for Smooth Wall Poly (Vinyl Chloride) (PVC) Plastic Underdrain Systems for Highway, Airport, and Similar Drainage
ASTM F794	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Gravity Sewer Pipe & Fittings Based on Controlled Inside Diameter
ASTM F949	Standard Specification for Poly (Vinyl Chloride) (PVC) Corrugated Sewer Pipe with a Smooth Interior and Fittings
ASTM F2562	Specification for Steel Reinforced Thermoplastic Ribbed Pipe and Fittings for Non-Pressure Drainage and Sewerage

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M190	Standard Specification for Bituminous - Coated Corrugated Metal Culvert Pipe and Pipe Arches
AASHTO M196	Standard Specification for Corrugated Aluminum Pipe for Sewers and Drains
AASHTO M252	Standard Specification for Corrugated Polyethylene Drainage Pipe
AASHTO M288	Standard Specification for Geotextile Specification for Highway Applications
AASHTO M294	Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter
AASHTO M304	Standard Specification for Poly (Vinyl Chloride) (PVC) Profile Wall Drain Pipe and Fittings Based on Controlled Inside Diameter
AASHTO MP20	Standard Specification for Steel-Reinforced Polyethylene (PE) Ribbed Pipe, 300- to 900-mm (12- to 36-in.) diameter
AASHTO	Standard Specifications for Highway Bridges

END OF ITEM D-705

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Item D-751 Manholes, Catch Basins, Inlets and Inspection Holes

DESCRIPTION

751-1.1 This item shall consist of construction of manholes, catch basins, inlets, and inspection holes, in accordance with these specifications, at the specified locations and conforming to the lines, grades, and dimensions shown on the plans or required by the RPR.

MATERIALS

751-2.1 Brick. The brick shall conform to the requirements of ASTM C32, Grade MS.

751-2.2 Mortar. Mortar shall consist of one part Portland cement and two parts sand. The cement shall conform to the requirements of ASTM C150, Type I. The sand shall conform to the requirements of ASTM C144.

751-2.3 Concrete. Plain and reinforced concrete used in structures, connections of pipes with structures, and the support of structures or frames shall conform to the requirements of Item P-610.

751-2.4 Precast concrete pipe manhole rings. Precast concrete pipe manhole rings shall conform to the requirements of ASTM C478. Unless otherwise specified, the risers and offset cone sections shall have an inside diameter of not less than 36 inches (90 cm) nor more than 48 inches (120 cm). There shall be a gasket between individual sections and sections cemented together with mortar on the inside of the manhole. Gaskets shall conform to the requirements of ASTM C443.

751-2.5 Corrugated metal. Corrugated metal shall conform to the requirements of American Association of State Highway and Transportation Officials (AASHTO) M36.

751-2.6 Frames, covers, and grates. The castings shall conform to one of the following requirements:

a. ASTM A48, Class 35B: Gray iron castings

b. ASTM A47: Malleable iron castings

c. ASTM A27: Steel castings

d. ASTM A283, Grade D: Structural steel for grates and frames

e. ASTM A536, Grade 65-45-12: Ductile iron castings

f. ASTM A897: Austempered ductile iron castings

All castings or structural steel units shall conform to the dimensions shown on the plans and shall be designed to support the loadings, aircraft gear configuration and/or direct loading, specified.

Each frame and cover or grate unit shall be provided with fastening members to prevent it from being dislodged by traffic but which will allow easy removal for access to the structure.

All castings shall be thoroughly cleaned. After fabrication, structural steel units shall be galvanized to meet the requirements of ASTM A123.

751-2.7 Steps. The steps or ladder bars shall be gray or malleable cast iron or galvanized steel. The steps shall be the size, length, and shape shown on the plans and those steps that are not galvanized shall be given a coat of asphalt paint, when directed.

751-2.8 Precast inlet structures. Manufactured in accordance with and conforming to ASTM C913.

CONSTRUCTION METHODS

751-3.1 Unclassified excavation.

a. The Contractor shall excavate for structures and footings to the lines and grades or elevations, shown on the plans, or as staked by the RPR. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown. The elevations of the bottoms of footings, as shown on the plans, shall be considered as approximately only; and the RPR may direct, in writing, changes in dimensions or elevations of footings necessary for a satisfactory foundation.

b. Boulders, logs, or any other objectionable material encountered in excavation shall be removed. All rock or other hard foundation material shall be cleaned of all loose material and cut to a firm surface either level, stepped, or serrated, as directed by the RPR. All seams or crevices shall be cleaned out and grouted. All loose and disintegrated rock and thin strata shall be removed. Where concrete will rest on a surface other than rock, the bottom of the excavation shall not be disturbed and excavation to final grade shall not be made until immediately before the concrete or reinforcing is placed.

c. The Contractor shall do all bracing, sheathing, or shoring necessary to implement and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheathing, or shoring shall be included in the unit price bid for the structure.

d. All bracing, sheathing, or shoring involved in the construction of this item shall be removed by the Contractor after the completion of the structure. Removal shall not disturb or damage finished masonry. The cost of removal shall be included in the unit price bid for the structure.

e. After excavation is completed for each structure, the Contractor shall notify the RPR. No concrete or reinforcing steel shall be placed until the RPR has approved the depth of the excavation and the character of the foundation material.

751-3.2 Brick structures.

a. Foundations. A prepared foundation shall be placed for all brick structures after the foundation excavation is completed and accepted. Unless otherwise specified, the base shall consist of reinforced concrete mixed, prepared, and placed in accordance with the requirements of Item P-610.

b. Laying brick. All brick shall be clean and thoroughly wet before laying so that they will not absorb any appreciable amount of additional water at the time they are laid. All brick shall be laid in freshly made mortar. Mortar not used within 45 minutes after water has been added shall be discarded. Retempering of mortar shall not be permitted. An ample layer of mortar shall be spread on the beds and a shallow furrow shall be made in it that can be readily closed by the laying of the brick. All bed and head joints shall be filled solid with mortar. End joints of stretchers and side or cross joints of headers shall be fully buttered with mortar and a shoved joint made to squeeze out mortar at the top of the joint. Any bricks that may be loosened after the mortar has taken its set, shall be removed, cleaned, and re-laid with fresh mortar. No broken or chipped brick shall be used in the face, and no spalls or bats shall be used except where necessary to shape around irregular openings or edges; in which case, full bricks shall be placed at ends or corners where possible, and the bats shall be used in the interior of the course. In making closures, no piece of brick shorter than the width of a whole brick shall be used; and wherever practicable, whole brick shall be used and laid as headers.

c. Joints. All joints shall be filled with mortar at every course Exterior faces shall be laid up in advance of backing. Exterior faces shall be plastered or parged with a coat of mortar not less than 3/8 inch (9 mm) thick before the backing is laid up. Prior to parging, all joints on the back of face courses shall be

cut flush. Unless otherwise noted, joints shall be not less than 1/4 inch (6 mm) nor more than 1/2 inch (12 mm) wide and the selected joint width shall be maintained uniform throughout the work.

d. Pointing. Face joints shall be neatly struck, using the weather-struck joint. All joints shall be finished properly as the laying of the brick progresses. When nails or line pins are used, the holes shall be immediately plugged with mortar and pointed when the nail or pin is removed.

e. Cleaning. Upon completion of the work all exterior surfaces shall be thoroughly cleaned by scrubbing and washing with water. If necessary to produce satisfactory results, cleaning shall be done with a 5% solution of muriatic acid which shall then be rinsed off with liberal quantities of water.

f. Curing and cold weather protection. The brick masonry shall be protected and kept moist for at least 48 hours after laying the brick. Brick masonry work or pointing shall not be done when there is frost on the brick or when the air temperature is below 50°F (10°C) unless the Contractor has, on the project ready to use, suitable covering and artificial heating devices necessary to keep the atmosphere surrounding the masonry at a temperature of not less than 60°F (16°C) for the duration of the curing period.

751-3.3 Concrete structures. Concrete structures which are to be cast-in-place within the project boundaries shall be built on prepared foundations, conforming to the dimensions and shape indicated on the plans. The construction shall conform to the requirements specified in Item P-610. Any reinforcement required shall be placed as indicated on the plans and shall be approved by the RPR before the concrete is placed.

All invert channels shall be constructed and shaped accurately to be smooth, uniform, and cause minimum resistance to flowing water. The interior bottom shall be sloped to the outlet.

751-3.4 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another RPR approved third party certification program.

Precast concrete structures shall conform to ASTM C478. Precast concrete structures shall be constructed on prepared or previously placed slab foundations conforming to the dimensions and locations shown on the plans. All precast concrete sections necessary to build a completed structure shall be furnished. The different sections shall fit together readily. Joints between precast concrete risers and tops shall be full-bedded in cement mortar and shall: (1) be smoothed to a uniform surface on both interior and exterior of the structure or (2) utilize a rubber gasket per ASTM C443. The top of the upper precast concrete section shall be suitably formed and dimensioned to receive the metal frame and cover or grate, or other cap, as required. Provision shall be made for any connections for lateral pipe, including drops and leads that may be installed in the structure. The flow lines shall be smooth, uniform, and cause minimum resistance to flow. The metal or metal encapsulated steps that are embedded or built into the side walls shall be aligned and placed in accordance to ASTM C478. When a metal ladder replaces the steps, it shall be securely fastened into position.

751-3.5 Corrugated metal structures. Corrugated metal structures shall be prefabricated. All standard or special fittings shall be furnished to provide pipe connections or branches with the correct dimensions and of sufficient length to accommodate connecting bands. The fittings shall be welded in place to the metal structures. The top of the metal structure shall be designed so that either a concrete slab or metal collar may be attached to allow the fastening of a standard metal frame and grate or cover. Steps or ladders shall be furnished as shown on the plans. Corrugated metal structures shall be constructed on prepared foundations, conforming to the dimensions and locations as shown on the plans. When indicated, the structures shall be placed on a reinforced concrete base.

751-3.6 Inlet and outlet pipes. Inlet and outlet pipes shall extend through the walls of the structures a sufficient distance beyond the outside surface to allow for connections. They shall be cut off flush with

the wall on the inside surface of the structure, unless otherwise directed. For concrete or brick structures, mortar shall be placed around these pipes to form a tight, neat connection.

751-3.7 Placement and treatment of castings, frames, and fittings. All castings, frames, and fittings shall be placed in the positions indicated on the plans or as directed by the RPR, and shall be set true to line and elevation. If frames or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place before the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

When frames or fittings are placed on previously constructed masonry, the bearing surface of the masonry shall be brought true to line and grade and shall present an even bearing surface so the entire face or back of the unit will come in contact with the masonry. The unit shall be set in mortar beds and anchored to the masonry as indicated on the plans or as directed by the RPR. All units shall set firm and secure.

After the frames or fittings have been set in final position, the concrete or mortar shall be allowed to harden for seven (7) days before the grates or covers are placed and fastened down.

751-3.8 Installation of steps. The steps shall be installed as indicated on the plans or as directed by the RPR. When the steps are to be set in concrete, they shall be placed and secured in position before the concrete is placed. When the steps are installed in brick masonry, they shall be placed as the masonry is being built. The steps shall not be disturbed or used until the concrete or mortar has hardened for at least seven (7) days. After seven (7) days, the steps shall be cleaned and painted, unless they have been galvanized.

When steps are required with precast concrete structures they shall meet the requirements of ASTM C478. The steps shall be cast into the side of the sections at the time the sections are manufactured or set in place after the structure is erected by drilling holes in the concrete and cementing the steps in place.

When steps are required with corrugated metal structures, they shall be welded into aligned position at a vertical spacing of 12 inches (300 mm).

Instead of steps, prefabricated ladders may be installed. For brick or concrete structures, the ladder shall be held in place by grouting the supports in drilled holes. For metal structures, the ladder shall be secured by welding the top support to the structure and grouting the bottom support into drilled holes in the foundation or as directed by the RPR.

751-3.9 Backfilling.

a. After a structure has been completed, the area around it shall be backfilled with approved material, in horizontal layers not to exceed 8 inches (200 mm) in loose depth, and compacted to the density required in Item P-152. Each layer shall be deposited evenly around the structure to approximately the same elevation. The top of the fill shall meet the elevation shown on the plans or as directed by the RPR.

b. Backfill shall not be placed against any structure until approved by the RPR. For concrete structures, approval shall not be given until the concrete has been in place seven (7) days, or until tests establish that the concrete has attained sufficient strength to withstand any pressure created by the backfill and placing methods.

c. Backfill shall not be measured for direct payment. Performance of this work shall be considered an obligation of the Contractor covered under the contract unit price for the structure involved.

751-3.10 Cleaning and restoration of site. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt, and rubbish from the site. Surplus dirt may be deposited in embankments, shoulders, or as approved by the RPR. The Contractor shall restore all disturbed areas to their original condition. The Contractor shall remove all tools and equipment, leaving the entire site free, clear, and in good condition.

METHOD OF MEASUREMENT

751-4.1 Manholes, catch basins, inlets, and inspection holes shall be measured by the unit.

BASIS OF PAYMENT

751-5.1 The accepted quantities of manholes, catch basins, inlets, and inspection holes will be paid for at the contract unit price per each in place when completed. This price shall be full compensation for furnishing all materials and for all preparation, excavation, backfilling and placing of the materials; furnishing and installation of such specials and connections to pipes and other structures as may be required to complete the item as shown on the plans; and for all labor equipment, tools and incidentals necessary to complete the structure.

Payment will be made under:

Item D-751-5.1	Adjust Existing Manholes - per each

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 A27	Standard Specification for Steel Castings, Carbon, for General Application
ASTM A47	Standard Specification for Ferritic Malleable Iron Castings
ASTM A48	Standard Specification for Gray Iron Castings
ASTM A123	Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A283	Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
ASTM A536	Standard Specification for Ductile Iron Castings
ASTM A897	Standard Specification for Austempered Ductile Iron Castings
ASTM C32	Standard Specification for Sewer and Manhole Brick (Made from Clay or Shale)
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C443	Standard Specification for Joints for Concrete Pipe and Manholes, Using Rubber Gaskets.
ASTM C478	Standard Specification for Precast Reinforced Concrete Manhole Sections
ASTM C913	Standard Specification for Precast Concrete Water and Wastewater Structures.

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO M36	Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains

END OF ITEM D-751

Item L-108 Underground Power Cable for Airports

DESCRIPTION

108-1.1 This item shall consist of furnishing and installing power cables that are direct buried and furnishing and/or installing power cables within conduit or duct banks per these specifications at the locations shown on the plans. It includes excavation and backfill of trench for direct-buried cables only. Also included are the installation of counterpoise wires, ground wires, ground rods and connections, cable splicing, cable marking, cable testing, and all incidentals necessary to place the cable in operating condition as a completed unit to the satisfaction of the RPR. This item shall not include the installation of duct banks or conduit, trenching and backfilling for duct banks or conduit, or furnishing or installation of cable for FAA owned/operated facilities.

EQUIPMENT AND MATERIALS

108-2.1 General.

a. Airport lighting equipment and materials covered by advisory circulars (AC) shall be approved under the Airport Lighting Equipment Certification Program per AC 150/5345-53, current version.

b. All other equipment and materials covered by other referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification, when requested by the RPR.

c. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications. Materials supplied and/or installed that do not comply with these specifications shall be removed (when directed by the RPR) and replaced with materials that comply with these specifications at the Contractor's cost.

d. All materials and equipment used to construct this item shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete any non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment to which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in the project that may accrue directly or indirectly from late submissions or resubmissions of submittals.

e. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be electronically submitted in pdf format. The RPR reserves the right to reject any and all equipment, materials, or procedures that do not meet the system design and the standards and codes, specified in this document.

f. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for at least twelve (12) months from the date of final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner. The Contractor shall maintain a minimum insulation

resistance in accordance with paragraph 108-3.10e with isolation transformers connected in new circuits and new segments of existing circuits through the end of the contract warranty period when tested in accordance with AC 150/5340-26, *Maintenance Airport Visual Aid Facilities*, paragraph 5.1.3.1, Insulation Resistance Test.

108-2.2 Cable. Underground cable for airfield lighting facilities (runway and taxiway lights and signs) shall conform to the requirements of AC 150/5345-7, Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits latest edition. Conductors for use on 6.6 ampere primary airfield lighting series circuits shall be single conductor, seven strand, #8 American wire gauge (AWG), L-824 Type C , 5,000 volts, non-shielded, with cross-linked polyethylene insulation. L-824 conductors for use on the L-830 secondary of airfield lighting series circuits shall be sized in accordance with the manufacturer's recommendations. All other conductors shall comply with FAA and National Electric Code (NEC) requirements. Conductor sizes noted above shall not apply to leads furnished by manufacturers on airfield lighting transformers and fixtures.

Wire for electrical circuits up to 600 volts shall comply with Specification L-824 and/or Commercial Item Description A-A-59544A and shall be type THWN-2, 75°C for installation in conduit and RHW-2, 75°C for direct burial installations. Conductors for parallel (voltage) circuits shall be type and size and installed in accordance with NFPA-70, National Electrical Code.

Unless noted otherwise, all 600-volt and less non-airfield lighting conductor sizes are based on a 75°C, THWN-2, 600-volt insulation, copper conductors, not more than three single insulated conductors, in raceway, in free air. The conduit/duct sizes are based on the use of THWN-2, 600-volt insulated conductors. The Contractor shall make the necessary increase in conduit/duct sizes for other types of wire insulation. In no case shall the conduit/duct size be reduced. The minimum power circuit wire size shall be #12 AWG.

Conductor sizes may have been adjusted due to voltage drop or other engineering considerations. Equipment provided by the Contractor shall be capable of accepting the quantity and sizes of conductors shown in the Contract Documents. All conductors, pigtails, cable step-down adapters, cable step-up adapters, terminal blocks and splicing materials necessary to complete the cable termination/splice shall be considered incidental to the respective pay items provided.

Cable type, size, number of conductors, strand and service voltage shall be as specified in the Contract Document.

108-2.3 Bare copper wire (counterpoise, bare copper wire ground and ground rods). Wire for counterpoise or ground installations for airfield lighting systems shall be No. 6 AWG bare solid copper wire for counterpoise and/or No. 6 AWG insulated stranded for grounding bond wire per ASTM B3 and ASTM B8, and shall be bare copper wire. For voltage powered circuits, the equipment grounding conductor shall comply with NEC Article 250.

Ground rods shall be copper-clad steel. The ground rods shall be of the length and diameter specified on the plans, but in no case be less than 10 feet long and 3/4 inch in diameter.

108-2.4 Cable connections. In-line connections or splices of underground primary cables shall be of the type called for on the plans, and shall be one of the types listed below. No separate payment will be made for cable connections.

a. The cast splice. Not Used.

b. The field-attached plug-in splice. Field attached plug-in splices shall be installed as shown on the plans. The Contractor shall determine the outside diameter of the cable to be spliced and furnish appropriately sized connector kits and/or adapters. Tape or heat shrink tubing with integral sealant shall be in accordance with the manufacturer's requirements. Primary Connector Kits manufactured by Amerace, "Super Kit", Integro "Complete Kit", or approved equal is acceptable.

c. The factory-molded plug-in splice. Specification for L-823 Connectors, Factory-Molded to Individual Conductors, is acceptable.

d. The taped or heat-shrink splice. Not Used.

In all the above cases, connections of cable conductors shall be made using crimp connectors using a crimping tool designed to make a complete crimp before the tool can be removed. All L-823/L-824 splices and terminations shall be made per the manufacturer's recommendations and listings.

All connections of counterpoise, grounding conductors and ground rods shall be made by the exothermic process or approved equivalent, except that a light base ground clamp connector shall be used for attachment to the light base. All exothermic connections shall be made per the manufacturer's recommendations and listings.

108-2.5 Splicer qualifications. Every airfield lighting cable splicer shall be qualified in making airport cable splices and terminations on cables rated at or above 5,000 volts AC. The Contractor shall submit to the RPR proof of the qualifications of each proposed cable splicer for the airport cable type and voltage level to be worked on. Cable splicing/terminating personnel shall have a minimum of three (3) years continuous experience in terminating/splicing medium voltage cable.

108-2.6 Concrete. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

108-2.7 Flowable backfill. Not Used.

108-2.8 Cable identification tags. Cable identification tags shall be made from a non-corrosive material with the circuit identification stamped or etched onto the tag. The tags shall be of the type as detailed on the plans.

108-2.9 Tape. Electrical tapes shall be Scotch™ Electrical Tapes –Scotch™ 88 (1-1/2 inch (38 mm) wide) and Scotch™ 130C® linerless rubber splicing tape (2-inch (50 mm) wide), as manufactured by the Minnesota Mining and Manufacturing Company (3M™), or an approved equivalent.

108-2.10 Electrical coating. Electrical coating shall be Scotchkote™ as manufactured by 3M™, or an approved equivalent.

108-2.11 Existing circuits. Whenever the scope of work requires connection to an existing circuit, the existing circuit's insulation resistance shall be tested, in the presence of the RPR. The test shall be performed per this item and prior to any activity that will affect the respective circuit. The Contractor shall record the results on forms acceptable to the RPR. When the work affecting the circuit is complete, the circuit's insulation resistance shall be checked again, in the presence of the RPR. The Contractor shall record the results on forms acceptable to the RPR. The second reading shall be equal to or greater than the first reading or the Contractor shall make the necessary repairs to the existing circuit to bring the second reading above the first reading. All repair costs including a complete replacement of the L-823 connectors, L-830 transformers and L-824 cable, if necessary, shall be borne by the Contractor. All test results shall be submitted in the Operation and Maintenance (O&M) Manual. See electrical contract drawings for additional testing notes.

108-2.12 Detectable warning tape. Plastic, detectable, American Public Works Association (APWA) Red (electrical power lines, cables, conduit and lighting cable) with continuous legend tape shall be polyethylene film with a metalized foil core and shall be 3-6 inches (75-150 mm) wide. Detectable tape is incidental to the respective bid item. Detectable warning tape for communication cables shall be orange. Detectable warning tape color code shall comply with the APWA Uniform Color Code.

CONSTRUCTION METHODS

108-3.1 General. The Contractor shall install the specified cable at the approximate locations indicated on the plans. Unless otherwise shown on the plans, all cable required to cross under pavements expected to carry aircraft loads shall be installed in concrete encased duct banks. Cable shall be run without splices, from fixture to fixture.

Cable connections between lights will be permitted only at the light locations for connecting the underground cable to the primary leads of the individual isolation transformers. The Contractor shall be responsible for providing cable in continuous lengths for home runs or other long cable runs without connections unless otherwise authorized in writing by the RPR or shown on the plans.

In addition to connectors being installed at individual isolation transformers, L-823 cable connectors for maintenance and test points shall be installed at locations shown on the plans. Cable circuit identification markers shall be installed on both sides of the L-823 connectors installed and on both sides of slack loops where a future connector would be installed.

Provide not less than 3 feet (1 m) of cable slack on each side of all connections, isolation transformers, light units, and at points where cable is connected to field equipment. Where provisions must be made for testing or for future above grade connections, provide enough slack to allow the cable to be extended at least one foot (30 cm) vertically above the top of the access structure. This requirement also applies where primary cable passes through empty light bases, junction boxes, and access structures to allow for future connections, or as designated by the RPR.

Primary airfield lighting cables installed shall have cable circuit identification markers attached on both sides of each L-823 connector and on each airport lighting cable entering or leaving cable access points, such as manholes, hand holes, pull boxes, junction boxes, etc. Markers shall be of sufficient length for imprinting the cable circuit identification legend on one line, using letters not less than 1/4 inch (6 mm) in size. The cable circuit identification shall match the circuits noted on the construction plans.

108-3.2 Installation in duct banks or conduits. This item includes the installation of the cable in duct banks or conduit per the following paragraphs. The maximum number and voltage ratings of cables installed in each single duct or conduit, and the current-carrying capacity of each cable shall be per the latest version of the National Electric Code, or the code of the local agency or authority having jurisdiction.

The Contractor shall make no connections or splices of any kind in cables installed in conduits or duct banks.

Unless otherwise designated in the plans, where ducts are in tiers, use the lowest ducts to receive the cable first, with spare ducts left in the upper levels. Check duct routes prior to construction to obtain assurance that the shortest routes are selected and that any potential interference is avoided.

Duct banks or conduits shall be installed as a separate item per Item L-110, Airport Underground Electrical Duct Banks and Conduit. The Contractor shall run a mandrel through duct banks or conduit prior to installation of cable to ensure that the duct bank or conduit is open, continuous and clear of debris. The mandrel size shall be compatible with the conduit size. The Contractor shall swab out all conduits/ducts and clean light bases, manholes, etc., interiors immediately prior to pulling cable. Once cleaned and swabbed, the light bases and all accessible points of entry to the duct/conduit system shall be kept closed except when installing cables. Cleaning of ducts, light bases, manholes, etc., is incidental to the pay item of the item being cleaned. All raceway systems left open, after initial cleaning, for any reason shall be re-cleaned at the Contractor’s expense. The Contractor shall verify existing ducts proposed for use in this project as clear and open. The Contractor shall notify the RPR of any blockage in the existing ducts.

The cable shall be installed in a manner that prevents harmful stretching of the conductor, damage to the insulation, or damage to the outer protective covering. The ends of all cables shall be sealed with moisture-seal tape providing moisture-tight mechanical protection with minimum bulk, or alternately, heat shrinkable tubing before pulling into the conduit and it shall be left sealed until connections are made. Where more than one cable is to be installed in a conduit, all cable shall be pulled in the conduit at the same time. The pulling of a cable through duct banks or conduits may be accomplished by hand winch or power winch with the use of cable grips or pulling eyes. Maximum pulling tensions shall not exceed the cable manufacturer's recommendations. A non-hardening cable-pulling lubricant recommended for the type of cable being installed shall be used where required.

The Contractor shall submit the recommended pulling tension values to the RPR prior to any cable installation. If required by the RPR, pulling tension values for cable pulls shall be monitored by a dynamometer in the presence of the RPR. Cable pull tensions shall be recorded by the Contractor and reviewed by the RPR. Cables exceeding the maximum allowable pulling tension values shall be removed and replaced by the Contractor at the Contractor's expense.

The manufacturer's minimum bend radius or NEC requirements (whichever is more restrictive) shall apply. Cable installation, handling and storage shall be per manufacturer's recommendations. During cold weather, particular attention shall be paid to the manufacturer's minimum installation temperature. Cable shall not be installed when the temperature is at or below the manufacturer's minimum installation temperature. At the Contractor's option, the Contractor may submit a plan, for review by the RPR, for heated storage of the cable and maintenance of an acceptable cable temperature during installation when temperatures are below the manufacturer's minimum cable installation temperature.

Cable shall not be dragged across base can or manhole edges, pavement or earth. When cable must be coiled, lay cable out on a canvas tarp or use other appropriate means to prevent abrasion to the cable jacket.

108-3.3 Installation of direct-buried cable in trenches. Not Used.

108-3.4 Cable markers for direct-buried cable. Not Used.

108-3.5 Splicing. Connections of the type shown on the plans shall be made by experienced personnel regularly engaged in this type of work and shall be made as follows:

a. Cast splices. Not Used.

b. Field-attached plug-in splices. These shall be assembled per the manufacturer's instructions. These splices shall be made by plugging directly into mating connectors. The joint where the connectors come together shall be finished by one of the following methods: (1) wrapped with at least one layer of rubber or synthetic rubber tape and one layer of plastic tape, one-half lapped, extending at least 1-1/2 inches (38 mm) on each side of the joint (2) Covered with heat shrinkable tubing with integral sealant extending at least 1-1/2 inches (38 mm) on each side of the joint or (3) On connector kits equipped with water seal flap; roll-over water seal flap to sealing position on mating connector.

c. Factory-molded plug-in splices. These shall be made by plugging directly into mating connectors. The joint where the connectors come together shall be finished by one of the following methods: (1) Wrapped with at least one layer of rubber or synthetic rubber tape and one layer of plastic tape, one-half lapped, extending at least 1-1/2 inches (38 mm) on each side of the joint. (2) Covered with heat shrinkable tubing with integral sealant extending at least 1-1/2 inches (38 mm) on each side of the joint. or (3) On connector kits so equipped with water seal flap; roll-over water seal flap to sealing position on mating connector.

d. Taped or heat-shrink splices. Not Used.

e. Assembly. Surfaces of equipment or conductors being terminated or connected shall be prepared in accordance with industry standard practice and manufacturer's recommendations. All surfaces to be connected shall be thoroughly cleaned to remove all dirt, grease, oxides, nonconductive films, or other foreign material. Paints and other nonconductive coatings shall be removed to expose base metal. Clean all surfaces at least 1/4 inch (6.4 mm) beyond all sides of the larger bonded area on all mating surfaces. Use a joint compound suitable for the materials used in the connection. Repair painted/coated surface to original condition after completing the connection.

108-3.6 Bare counterpoise wire installation for lightning protection and grounding. If shown on the plans or included in the job specifications, bare solid #6 AWG copper counterpoise wire shall be installed for lightning protection of the underground cables. The RPR shall select one of two methods of lightning protection for the airfield lighting circuit based upon sound engineering practice and lightning strike density.

a. Equipotential. The counterpoise size is as shown on the plans. The equipotential method is applicable to all airfield lighting systems; i.e. runway, taxiway, apron – touchdown zone, centerline, edge, threshold and approach lighting systems. The equipotential method is also successfully applied to provide lightning protection for power, signal and communication systems. The light bases, counterpoise, etc – all components - are bonded together and bonded to the vault power system ground loop/electrode.

Counterpoise wire shall be installed in the same trench for the entire length of buried cable, conduits and duct banks that are installed to contain airfield cables. The counterpoise is centered over the cable/conduit/duct to be protected.

The counterpoise conductor shall be installed no less than 8 inches (200 mm) minimum or 12 inches (300 mm) maximum above the raceway or cable to be protected, except as permitted below:

(1) The minimum counterpoise conductor height above the raceway or cable to be protected shall be permitted to be adjusted subject to coordination with the airfield lighting and pavement designs.

(2) The counterpoise conductor height above the protected raceway(s) or cable(s) shall be calculated to ensure that the raceway or cable is within a 45-degree area of protection, (45 degrees on each side of vertical creating a 90 degree angle).

The counterpoise conductor shall be bonded to each metallic light base, mounting stake, and metallic airfield lighting component.

All metallic airfield lighting components in the field circuit on the output side of the constant current regulator (CCR) or other power source shall be bonded to the airfield lighting counterpoise system.

All components rise and fall at the same potential; with no potential difference, no damaging arcing and no damaging current flow.

See AC 150/5340-30, Design and Installation Details for Airport Visual Aids and NFPA 780, Standard for the Installation of Lightning Protection Systems, Chapter 11, for a detailed description of the Equipotential Method of lightning protection.

Reference FAA STD-019E, Lightning and Surge Protection, Grounding Bonding and Shielding Requirements for Facilities and Electronic Equipment, Part 4.1.1.7.

b. Isolation. Not Used.

c. Common Installation requirements. When a metallic light base is used, the grounding electrode shall be bonded to the metallic light base or mounting stake with a No. 6 AWG bare, annealed or soft drawn, solid copper conductor.

When a nonmetallic light base is used, the grounding electrode shall be bonded to the metallic light fixture or metallic base plate with a No. 6 AWG bare, annealed or soft drawn, solid copper conductor.

Grounding electrodes may be rods, ground dissipation plates, radials, or other electrodes listed in the NFPA 70 (NEC) or NFPA 780.

Where raceway is installed by the directional bore, jack and bore, or other drilling method, the counterpoise conductor shall be permitted to be installed concurrently with the directional bore, jack and bore, or other drilling method raceway, external to the raceway or sleeve.

The counterpoise wire shall also be exothermically welded to ground rods installed as shown on the plans but not more than 500 feet (150 m) apart around the entire circuit. The counterpoise system shall be continuous and terminate at the transformer vault or at the power source. It shall be securely attached to the vault or equipment external ground ring or other made electrode-grounding system. The connections shall be made as shown on the plans and in the specifications.

Where an existing airfield lighting system is being extended or modified, the new counterpoise conductors shall be interconnected to existing counterpoise conductors at each intersection of the new and existing airfield lighting counterpoise systems.

d. Parallel Voltage Systems. Provide grounding and bonding in accordance with NFPA 70, National Electrical Code.

108-3.7 Counterpoise installation above multiple conduits and duct banks. Counterpoise wires shall be installed above multiple conduits/duct banks for airfield lighting cables, with the intent being to provide a complete area of protection over the airfield lighting cables. When multiple conduits and/or duct banks for airfield cable are installed in the same trench, the number and location of counterpoise wires above the conduits shall be adequate to provide a complete area of protection measured 45 degrees each side of vertical.

Where duct banks pass under pavement to be constructed in the project, the counterpoise shall be placed above the duct bank. Reference details on the construction plans.

108-3.8 Counterpoise installation at existing duct banks. When airfield lighting cables are indicated on the plans to be routed through existing duct banks, the new counterpoise wiring shall be terminated at ground rods at each end of the existing duct bank where the cables being protected enter and exit the duct bank. The new counterpoise conductor shall be bonded to the existing counterpoise system.

108-3.9 Exothermic bonding. Bonding of counterpoise wire shall be by the exothermic welding process or equivalent method accepted by the RPR. Only personnel experienced in and regularly engaged in this type of work shall make these connections.

Contractor shall demonstrate to the satisfaction of the RPR, the welding kits, materials and procedures to be used for welded connections prior to any installations in the field. The installations shall comply with the manufacturer's recommendations and the following:

a. All slag shall be removed from welds.

b. Using an exothermic weld to bond the counterpoise to a lug on a galvanized light base is not recommended unless the base has been specially modified. Consult the manufacturer's installation directions for proper methods of bonding copper wire to the light base. See AC 150/5340-30 for galvanized light base exception.

c. If called for in the plans, all buried copper and weld material at weld connections shall be thoroughly coated with 6 mm of 3M™ Scotchkote™, or approved equivalent, or coated with coal tar Bitumastic® material to prevent surface exposure to corrosive soil or moisture.

108-3.10 Testing. The Contractor shall furnish all necessary equipment and appliances for testing the airport electrical systems and underground cable circuits before and after installation. The Contractor shall perform all tests in the presence of the RPR. The Contractor shall demonstrate the electrical characteristics to the satisfaction of the RPR. All costs for testing are incidental to the respective item

being tested. For phased projects, the tests must be completed by phase. The Contractor must maintain the test results throughout the entire project as well as during the warranty period that meet the following:

a. Earth resistance testing methods shall be submitted to the RPR for approval. Earth resistance testing results shall be recorded on an approved form and testing shall be performed in the presence of the RPR. All such testing shall be at the sole expense of the Contractor.

b. Should the counterpoise or ground grid conductors be damaged or suspected of being damaged by construction activities the Contractor shall test the conductors for continuity with a low resistance ohmmeter. The conductors shall be isolated such that no parallel path exists and tested for continuity. The RPR shall approve of the test method selected. All such testing shall be at the sole expense of the Contractor.

After installation, the Contractor shall test and demonstrate to the satisfaction of the RPR the following:

c. That all affected lighting power and control circuits (existing and new) are continuous and free from short circuits.

d. That all affected circuits (existing and new) are free from unspecified grounds.

e. That the insulation resistance to ground of all new non-grounded high voltage series circuits or cable segments is not less than 50 megohms. Verify continuity of all series airfield lighting circuits prior to energization.

f. That the insulation resistance to ground of all new non-grounded conductors of new multiple circuits or circuit segments is not less than 100 megohms.

g. That all affected circuits (existing and new) are properly connected per applicable wiring diagrams.

h. That all affected circuits (existing and new) are operable. Tests shall be conducted that include operating each control not less than 10 times and the continuous operation of each lighting and power circuit for not less than 1/2 hour.

i. That the impedance to ground of each ground rod does not exceed 25 ohms prior to establishing connections to other ground electrodes. The fall-of-potential ground impedance test shall be used, as described by American National Standards Institute/Institute of Electrical and Electronic Engineers (ANSI/IEEE) Standard 81, to verify this requirement. As an alternate, clamp-on style ground impedance test meters may be used to satisfy the impedance testing requirement. Test equipment and its calibration sheets shall be submitted for review and approval by the RPR prior to performing the testing.

Two copies of tabulated results of all cable tests performed shall be supplied by the Contractor to the RPR. Where connecting new cable to existing cable, insulation resistance tests shall be performed on the new cable prior to connection to the existing circuit.

There are no approved “repair” procedures for items that have failed testing other than complete replacement.

METHOD OF MEASUREMENT

108-4.1 No separate measurement shall be made for trenching, including the excavation, backfill, and restoration. The cost of all excavation, backfill, dewatering and restoration regardless of the type of material encountered shall be included in the unit price bid of the respective pay item(s) for conduit, duct bank, electrical manholes, electrical handhole, junction structures, and light base installations.

108-4.2 Cable or counterpoise wire installed in trench, duct bank or conduit shall be measured by the number of linear feet (meters) installed and grounding connectors, and trench marking tape ready for

operation, and accepted as satisfactory. Separate measurement shall be made for each cable or counterpoise wire installed in trench, duct bank or conduit. The measurement for this item shall include additional quantities required for slack.

108-4.3 No separate payment will be made for ground rods.

108-4.4 Cable removed and disposed shall be measured by the linear feet of cable(s) removed from conduit. No separate measurement shall be made for each cable removed from duct bank or conduit

BASIS OF PAYMENT

108-5.1 Remove Existing Cable(s) in Conduit or Duct Bank . Payment will be made at the contract unit price for cable removal from existing conduit or duct bank by the Contractor and accepted by the RPR. This price shall be full compensation for furnishing all materials and for all preparation and installation of these materials, and for all labor, equipment, tools, and incidentals, including all pulling material and equipment necessary to complete this item.

108-5.2 Furnish and Install No. 8 AWG, 1/C, 5kV, L-824 Type C Cable in Duct Bank or Conduit. Payment will be made at the contract unit price for No. 8 AWG, 1/C, 5kV, L-824 Type C Cable, installed in duct bank or conduit, in place by the Contractor and accepted by the RPR. This price shall be full compensation for furnishing all materials and for all preparation and installation of these materials, and for all labor, equipment, tools, testing, and incidentals, including cable pulling tape/rope/pull cord and connections, conduit mandrel, conduit piston, and cable splices/connections, necessary to complete this item.

108-5.3 Furnish and Install No. 6 AWG, Solid, Bare Copper Counterpoise Wire Above the Duct Bank or Conduit. Payment will be made at the contract unit price for No. 6 AWG, solid, bare copper counterpoise wire, installed above duct bank or conduit, in place by the Contractor and accepted by the RPR. This price shall be full compensation for furnishing all materials and for all preparation and installation of these materials, and for all labor, equipment, tools, testing, and incidentals, including ground rods, exothermic connections, and ground connectors, necessary to complete this item.

Payment will be made under:

Item L-108-5.1	Remove Existing Cable(s) in Conduit or Duct Bank - per liner foot
Item L-108-5.2	Furnish and Install No. 8 AWG**,** 5 kV, L-824, Type C Cable in Duct Bank or Conduit - per liner foot
Item L-108-5.3	Furnish and Install No. 6 AWG, Solid, Bare Copper Counterpoise Wire Above the Duct Bank or Conduit- 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.

Advisory Circulars (AC)

AC 150/5340-26	Maintenance of Airport Visual Aid Facilities
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits

AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-53	Airport Lighting Equipment Certification Program

Commercial Item Description

A-A-59544A	Cable and Wire, Electrical (Power, Fixed Installation)
A-A-55809	Insulation Tape, Electrical, Pressure-Sensitive Adhesive, Plastic

ASTM International (ASTM)

ASTM B3	Standard Specification for Soft or Annealed Copper Wire
ASTM B8	Standard Specification for Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard, or Soft
ASTM B33	Standard Specification for Tin-Coated Soft or Annealed Copper Wire for Electrical Purposes
ASTM D4388	Standard Specification for Nonmetallic Semi-Conducting and Electrically Insulating Rubber Tapes

Mil Spec

MIL-PRF-23586F	Performance Specification: Sealing Compound (with Accelerator), Silicone Rubber, Electrical
MIL-I-24391	Insulation Tape, Electrical, Plastic, Pressure Sensitive

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)
NFPA-780	Standard for the Installation of Lightning Protection Systems

American National Standards Institute (ANSI)/Institute of Electrical and Electronics Engineers (IEEE)

ANSI/IEEE STD 81	IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System

Federal Aviation Administration Standard

FAA STD-019E	Lightning and Surge Protection, Grounding Bonding and Shielding Requirements for Facilities and Electronic Equipment

END OF ITEM L-108

Item L-110 Airport Underground Electrical Duct Banks and Conduits

DESCRIPTION

110-1.1 This item shall consist of underground electrical conduits and duct banks (single or multiple conduits encased in concrete or buried in sand) installed per this specification at the locations and per the dimensions, designs, and details shown on the plans. This item shall include furnishing and installing of all underground electrical duct banks and individual and multiple underground conduits and removal of existing duct banks. It shall also include all turfing trenching, backfilling, removal, and restoration of any paved or turfed areas; concrete encasement, mandrelling, pulling lines, duct markers, plugging of conduits, and the testing of the installation as a completed system ready for installation of cables per the plans and specifications. This item shall also include furnishing and installing conduits and all incidentals for providing positive drainage of the system. Verification of existing ducts is incidental to the pay items provided in this specification.

EQUIPMENT AND MATERIALS

110-2.1 General.

a. All equipment and materials covered by referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when requested by the RPR.

b. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications and acceptable to the RPR. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the RPR and replaced with materials, that comply with these specifications, at the Contractor's cost.

c. All materials and equipment used to construct this item shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in project that accrue directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be electronically submitted in pdf format, tabbed by specification section**.** The RPR reserves the right to reject any and all equipment, materials or procedures that do not meet the system design and the standards and codes specified in this document.

e. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

110-2.2 Steel conduit. Rigid galvanized steel (RGS) conduit and fittings shall be hot dipped galvanized inside and out and conform to the requirements of Underwriters Laboratories Standards 6, 514B, and 1242. All RGS conduits or RGS elbows installed below grade, in concrete, permanently wet locations or other similar environments shall be painted with a 10-mil thick coat of asphaltum sealer or shall have a factory-bonded polyvinyl chloride (PVC) cover. Any exposed galvanizing or steel shall be coated with 10 mils of asphaltum sealer. When using PVC coated RGS conduit, care shall be exercised not to damage the factory PVC coating. Damaged PVC coating shall be repaired per the manufacturer's written instructions. In lieu of PVC coated RGS, corrosion wrap tape shall be permitted to be used where RGS is in contact with direct earth."

110-2.3 Plastic conduit. Plastic conduit and fittings-shall conform to the following requirements:

- UL 514B covers W-C-1094-Conduit fittings all types, classes 1 thru 3 and 6 thru 10.
- UL 514C covers W-C-1094- all types, Class 5 junction box and cover in plastic (PVC).
- UL 651 covers W-C-1094-Rigid PVC Conduit, types I and II, Class 4.
- UL 651A covers W-C-1094-Rigid PVC Conduit and high-density polyethylene (HDPE) Conduit type III and Class 4.

Underwriters Laboratories Standards UL-651 and Article 352 of the current National Electrical Code shall be one of the following, as shown on the plans:

a. Type I–Schedule 40 and Schedule 80 PVC suitable for underground use either direct-buried or encased in concrete.

b. Type II–Schedule 40 PVC suitable for either above ground or underground use.

c. Type III – Schedule 80 PVC suitable for either above ground or underground use either direct-buried or encased in concrete.

d. Type III –HDPE pipe, minimum standard dimensional ratio (SDR) 11, suitable for placement with directional boring under pavement.

The type of solvent cement shall be as recommended by the conduit/fitting manufacturer.

110-2.4 Split conduit. Split conduit shall be pre-manufactured for the intended purpose and shall be made of steel or plastic.

110-2.5 Conduit spacers. Conduit spacers shall be prefabricated interlocking units manufactured for the intended purpose. They shall be of double wall construction made of high grade, high density polyethylene complete with interlocking cap and base pads. They shall be designed to accept No. 4 reinforcing bars installed vertically.

110-2.6 Concrete. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

110-2.7 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another RPR approved third party certification program. Precast concrete structures shall conform to ASTM C478.

110-2.8 Flowable backfill. Flowable material used to back fill conduit and duct bank trenches shall conform to the requirements of Item P-153, Controlled Low Strength Material.

110-2.9 Detectable warning tape. Plastic, detectable, American Public Works Association (APWA) red (electrical power lines, cables, conduit and lighting cable), orange (telephone/fiber optic cabling) with continuous legend magnetic tape shall be polyethylene film with a metallized foil core and shall be 3-6 inches (75-150 mm) wide. Detectable tape is incidental to the respective bid item.

CONSTRUCTION METHODS

110-3.1 General. The Contractor shall install underground duct banks and conduits at the approximate locations indicated on the plans. The RPR shall indicate specific locations as the work progresses, if required to differ from the plans. Duct banks and conduits shall be of the size, material, and type indicated on the plans or specifications. Where no size is indicated on the plans or in the specifications, conduits shall be not less than 2 inches (50 mm) inside diameter or comply with the National Electrical Code based on cable to be installed, whichever is larger. All duct bank and conduit lines shall be laid so as to grade toward access points and duct or conduit ends for drainage. Unless shown otherwise on the plans, grades shall be at least 3 inches (75 mm) per 100 feet (30 m). On runs where it is not practicable to maintain the grade all one way, the duct bank and conduit lines shall be graded from the center in both directions toward access points or conduit ends, with a drain into the storm drainage system. Pockets or traps where moisture may accumulate shall be avoided. Under pavement, the top of the duct bank shall not be less than 18 inches (0.5 m) below the subgrade; in other locations, the top of the duct bank or underground conduit shall be be not less than 18 inches (0.5 m) below finished grade.

The Contractor shall mandrel each individual conduit whether the conduit is direct-buried or part of a duct bank. An iron-shod mandrel, not more than 1/4 inch (6 mm) smaller than the bore of the conduit shall be pulled or pushed through each conduit. The mandrel shall have a leather or rubber gasket slightly larger than the conduit hole.

The Contractor shall swab out all conduits/ducts and clean base can, manhole, pull boxes, etc., interiors immediately prior to pulling cable. Once cleaned and swabbed the light bases, manholes, pull boxes, etc., and all accessible points of entry to the duct/conduit system shall be kept closed except when installing cables. Cleaning of ducts, base cans, manholes, etc., is incidental to the pay item of the item being cleaned. All raceway systems left open, after initial cleaning, for any reason shall be recleaned at the Contractor’s expense. All accessible points shall be kept closed when not installing cable. The Contractor shall verify existing ducts proposed for use in this project as clear and open. The Contractor shall notify the RPR of any blockage in the existing ducts.

For pulling the permanent wiring, each individual conduit, whether the conduit is direct-buried or part of a duct bank, shall be provided with a 200-pound (90 kg) test polypropylene pull rope. The ends shall be secured and sufficient length shall be left in access points to prevent it from slipping back into the conduit. Where spare conduits are installed, as indicated on the plans, the open ends shall be plugged with removable tapered plugs, designed for this purpose.

All conduits shall be securely fastened in place during construction and shall be plugged to prevent contaminants from entering the conduits. Any conduit section having a defective joint shall not be installed. Ducts shall be supported and spaced apart using approved spacers at intervals not to exceed 5 feet (1.5 m).

Unless otherwise shown on the plans, concrete encased duct banks shall be used when crossing under pavements expected to carry aircraft loads, such as runways, taxiways, taxilanes, ramps and aprons. When under paved shoulders and other paved areas, conduit and duct banks shall be encased using flowable fill for protection.

All conduits within concrete encasement of the duct banks shall terminate with female ends for ease in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

Where turf is well established and the sod can be removed, it shall be carefully stripped and properly stored.

Trenches for conduits and duct banks may be excavated manually or with mechanical trenching equipment unless in pavement, in which case they shall be excavated with mechanical trenching equipment. Walls of trenches shall be essentially vertical so that a minimum of shoulder surface is disturbed. Blades of graders shall not be used to excavate the trench.

When rock is encountered, the rock shall be removed to a depth of at least 3 inches (75 mm) below the required conduit or duct bank depth and it shall be replaced with bedding material of earth or sand containing no mineral aggregate particles that would be retained on a 1/4-inch (6.3 mm) sieve. Flowable backfill may alternatively be used

Underground electrical warning (Caution) tape shall be installed in the trench above all underground duct banks and conduits in unpaved areas. Contractor shall submit a sample of the proposed warning tape for approval by the RPR. If not shown on the plans, the warning tape shall be located 6 inches above the duct/conduit or the counterpoise wire if present.

Joints in plastic conduit shall be prepared per the manufacturer's recommendations for the particular type of conduit. Plastic conduit shall be prepared by application of a plastic cleaner and brushing a plastic solvent on the outside of the conduit ends and on the inside of the couplings. The conduit fitting shall then be slipped together with a quick one-quarter turn twist to set the joint tightly. Where more than one conduit is placed in a single trench, or in duct banks, joints in the conduit shall be staggered a minimum of 2 feet (60 cm).

Changes in direction of runs exceeding 10 degrees, either vertical or horizontal, shall be accomplished using manufactured sweep bends.

Whether or not specifically indicated on the drawings, where the soil encountered at established duct bank grade is an unsuitable material, as determined by the RPR, the unsuitable material shall be removed per Item P-152 and replaced with suitable material. Additional duct bank supports shall be installed, as approved by the RPR.

All excavation shall be unclassified and shall be considered incidental to Item L-110. Dewatering necessary for duct installation, and erosion per federal, state, and local requirements is incidental to Item L-110.

Unless otherwise specified, excavated materials that are deemed by the RPR to be unsuitable for use in backfill or embankments shall be removed and disposed of offsite.

Any excess excavation shall be filled with suitable material approved by the RPR and compacted per Item P-152.

It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Where existing active cables) cross proposed installations, the Contractor shall ensure that these cables are adequately protected. Where crossings are unavoidable, no splices will be allowed in the existing cables, except as specified on the plans. Installation of new cable where such crossings must occur shall proceed as follows:

a. Existing cables shall be located manually. Unearthed cables shall be inspected to assure absolutely no damage has occurred

b. Trenching, etc., in cable areas shall then proceed with approval of the RPR, with care taken to minimize possible damage or disruption of existing cable, including careful backfilling in area of cable.

In the event that any previously identified cable is damaged during the course of construction, the Contractor shall be responsible for the complete repair.

110-3.2 Duct banks. Unless otherwise shown in the plans, duct banks shall be installed so that the top of the concrete envelope is not less than 18 inches (0.5 m) below the bottom of the base or stabilized base

course layers where installed under runways, taxiways, aprons, or other paved areas, and not less than 18 inches (0.5 m) below finished grade where installed in unpaved areas.

Unless otherwise shown on the plans, duct banks under paved areas shall extend at least 3 feet (1 m) beyond the edges of the pavement or 3 feet (1 m) beyond any under drains that may be installed alongside the paved area. Trenches for duct banks shall be opened the complete length before concrete is placed so that if any obstructions are encountered, provisions can be made to avoid them. Unless otherwise shown on the plans, all duct banks shall be placed on a layer of concrete not less than 3 inches (75 mm) thick prior to its initial set. The Contractor shall space the conduits not less than 3 inches (75 mm) apart (measured from outside wall to outside wall). All such multiple conduits shall be placed using conduit spacers applicable to the type of conduit. As the conduit laying progresses, concrete shall be placed around and on top of the conduits not less than 3 inches (75 mm) thick unless otherwise shown on the plans. All conduits shall terminate with female ends for ease of access in current and future use. Install factory plugs in all unused ends. Do not cover the ends or plugs with concrete.

Conduits forming the duct bank shall be installed using conduit spacers. No. 4 reinforcing bars shall be driven vertically into the soil a minimum of 6 inches (150 mm) to anchor the assembly into the earth prior to placing the concrete encasement. For this purpose, the spacers shall be fastened down with locking collars attached to the vertical bars. Spacers shall be installed at 5-foot (1.5-m) intervals. Spacers shall be in the proper sizes and configurations to fit the conduits. Locking collars and spacers shall be submitted to the RPR for review prior to use.

When specified, the Contractor shall reinforce the bottom side and top of encasements with steel reinforcing mesh or fabric or other approved metal reinforcement. When directed, the Contractor shall supply additional supports where the ground is soft and boggy, where ducts cross under roadways, or where shown on the plans. Under such conditions, the complete duct structure shall be supported on reinforced concrete footings, piers, or piles located at approximately 5-foot (1.5-m) intervals.

All pavement surfaces that are to have ducts installed therein shall be neatly saw cut to form a vertical face. All excavation shall be included in the contract with price for the duct.

Install a plastic, detectable, color as noted, 3 to 6 inches (75 to 150 mm) wide tape, 8 inches (200 mm) minimum below grade above all underground conduit or duct lines not installed under pavement. Utilize the 3-inch (75-mm) wide tape only for single conduit runs. Utilize the 6-inch (150-mm) wide tape for multiple conduits and duct banks. For duct banks equal to or greater than 24 inches (600 mm) in width, utilize more than one tape for sufficient coverage and identification of the duct bank as required.

When existing cables are to be placed in split duct, encased in concrete, the cable shall be carefully located and exposed by hand tools. Prior to being placed in duct, the RPR shall be notified so that he may inspect the cable and determine that it is in good condition. Where required, split duct shall be installed as shown on the drawings or as required by the RPR.

110-3.3 Conduits without concrete encasement. Not Used.

110-3.4 Markers. The location of each end and of each change of direction of conduits and duct banks shall be marked by a concrete slab marker 2 feet (60 cm) square and 4 - 6 inches (100 - 150 mm) thick extending approximately one inch (25 mm) above the surface. The markers shall also be located directly above the ends of all conduits or duct banks, except where they terminate in a junction/access structure or building. Each cable or duct run from a line of lights and signs to the equipment vault must be marked at approximately every 200 feet (61 m) along the cable or duct run, with an additional marker at each change of direction of cable or duct run.

The Contractor shall impress the word “DUCT” or “CONDUIT” on each marker slab. Impression of letters shall be done in a manner, approved by the RPR, for a neat, professional appearance. All letters and words must be neatly stenciled. After placement, all markers shall be given one coat of high-visibility

orange paint, as approved by the RPR. The Contractor shall also impress on the slab the number and size of conduits beneath the marker along with all other necessary information as determined by the RPR. The letters shall be 4 inches (100 mm) high and 3 inches (75 mm) wide with width of stroke 1/2 inch (12 mm) and 1/4 inch (6 mm) deep or as large as the available space permits. Furnishing and installation of duct markers is incidental to the respective duct pay item.

110-3.5 Backfilling for conduits. For conduits, 8 inches (200 mm) of sand, soft earth, or other fine fill (loose measurement) shall be placed around the conduits ducts and carefully tamped around and over them with hand tampers. The remaining trench shall then be backfilled and compacted per Item P-152 except that material used for back fill shall be select material not larger than 4 inches (100 mm) in diameter.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during back filling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the RPR.

110-3.6 Backfilling for duct banks. After the concrete has cured, the remaining trench shall be backfilled and compacted per Item P-152 “Excavation and Embankment” except that the material used for backfill shall be select material not larger than 4 inches (100 mm) in diameter. In addition to the requirements of Item P-152, where duct banks are installed under pavement, one moisture/density test per lift shall be made for each 250 linear feet (76 m) of duct bank or one work period’s construction, whichever is less.

Flowable backfill may alternatively be used.

Trenches shall not contain pools of water during backfilling operations.

The trench shall be completely backfilled and tamped level with the adjacent surface; except that, where sod is to be placed over the trench, the backfilling shall be stopped at a depth equal to the thickness of the sod to be used, with proper allowance for settlement.

Any excess excavated material shall be removed and disposed of per instructions issued by the RPR.

110-3.7 Restoration. Where sod has been removed, it shall be replaced as soon as possible after the backfilling is completed. All areas disturbed by the work shall be restored to its original condition. The restoration shall include topsoiling and seeding shown on the plans. The Contractor shall be held responsible for maintaining all disturbed surfaces and replacements until final acceptance. All restoration shall be considered incidental to the respective L-110 pay item. Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD), and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

110-3.8 Ownership of removed cable. The existing cable of the lighting systems shall be removed as indicated. The contractor shall remove and dispose all cable off-site accordingly.

METHOD OF MEASUREMENT

110-4.1 Abandonment of Existing Conduit. Underground conduits to be abandoned shall be measure by the linear feet of conduits that are abandoned and capped as shown on plans.

110-4.2 Concrete Encased Electrical Conduit, 1 way 2-inch. Underground 1 way 2-inch conduits in paved areas shall be measured by the linear feet of conduit installed, including concrete encasement, trenching and backfilling with designated material, and restoration, all measured in place, completed, and accepted.

110-4.3 Expose Existing 2" Schedule 40 PVC Conduit, Cap, and Protect End for Future Conduit Connection. Exposure of existing conduit to be protected for future connection shall be measure per each conduit location exposed and protected until future connection is made.

BASIS OF PAYMENT

110-5.1 Abandonment of Existing Conduit. Payment will be made at the contract unit price per linear foot for the abandonment of existing conduits as shown on plans and accepted by RPR, including the filling with the designated material and capping the ends of each conduit. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item per the provisions and intent of the plans and specifications.

110-5.2 Concrete Encased Electrical Conduit, 1 way 2-inch. Payment will be made at the contract unit price per linear foot for concrete encased conduit,1 way 2-inch completed and accepted, including trenching, kerf cutting, excavation, conduit, conduit hold downs, conduit bases, concrete encasement, terminations into handholes, manholes, and junction structures, backfill with the designated material, and restoration. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item per the provisions and intent of the plans and specifications.

110-5.3 Expose Existing 2" Schedule 40 PVC Conduit, Cap, and Protect End for Future Conduit Connection. Payment shall be made at the contract unit price per each exposure of existing conduit to be protected for future conduit connections. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete this item per the provisions and intent of the plans and specifications.

Payment will be made under:

Item L-110-5.1	Removal of Existing Conduit - per linear foot
Item L-110-5.2	Concrete Encased Electrical Conduit, 1 way 2-inch - per linear foot
Item L-110-5.3	Expose Existing 2" Schedule 40 PVC Conduit, Cap, and Protect End for Future Conduit Connection - per each

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 Circular (AC)

AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-53	Airport Lighting Equipment Certification Program

ASTM International (ASTM)

ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)

Underwriters Laboratories (UL)

UL Standard 6	Electrical Rigid Metal Conduit - Steel
UL Standard 514B	Conduit, Tubing, and Cable Fittings
UL Standard 514C	Nonmetallic Outlet Boxes, Flush-Device Boxes, and Covers
UL Standard 1242	Electrical Intermediate Metal Conduit Steel
UL Standard 651	Schedule 40, 80, Type EB and A Rigid PVC Conduit and Fittings
UL Standard 651A	Type EB and A Rigid PVC Conduit and HDPE Conduit

END OF ITEM L-110

Item L-115 Electrical Manholes and Junction Structures

DESCRIPTION

115-1.1 This item shall consist of electrical manholes and junction structures (hand holes, pull boxes, junction cans, etc.) installed per this specification, at the indicated locations and conforming to the lines, grades and dimensions shown on the plans or as required by the RPR. This item shall include the installation of each electrical manhole and/or junction structures with all associated excavation, backfilling, sheeting and bracing, concrete, reinforcing steel, ladders, appurtenances, testing, dewatering and restoration of surfaces to the satisfaction of the RPR

EQUIPMENT AND MATERIALS

115-2.1 General.

a. All equipment and materials covered by referenced specifications shall be subject to acceptance through manufacturer's certification of compliance with the applicable specification when so requested by the RPR.

b. Manufacturer's certifications shall not relieve the Contractor of the responsibility to provide materials per these specifications. Materials supplied and/or installed that do not comply with these specifications shall be removed (when directed by the RPR) and replaced with materials that comply with these specifications at the Contractor's cost.

c. All materials and equipment used to construct this item shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Submittal data shall be presented in a clear, precise and thorough manner. Original catalog sheets are preferred. Photocopies are acceptable provided they are as good a quality as the original. Clearly and boldly mark each copy to identify products or models applicable to this project. Indicate all optional equipment and delete any non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment to which they apply on each submittal sheet. Markings shall be made bold and clear with arrows or circles (highlighting is not acceptable). The Contractor is solely responsible for delays in the project that may accrue directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications**.** The Contractor's submittals shall be electronically submitted in pdf format, tabbed by specification section. The RPR reserves the right to reject any and all equipment, materials or procedures that do not meet the system design and the standards and codes, specified in this document.

e. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from the date of final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

115-2.2 Concrete structures. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures. Cast-in-place concrete structures shall be as shown on the plans.

115-2.3 Precast concrete structures. Precast concrete structures shall be furnished by a plant meeting National Precast Concrete Association Plant Certification Program or another engineer approved third party certification program. Provide precast concrete structures where shown on the plans.

Precast concrete structures shall be an approved standard design of the manufacturer. Precast units shall have mortar or bitumastic sealer placed between all joints to make them watertight. The structure shall be designed to withstand **200,000** lb aircraft loads, unless otherwise shown on the plans. Openings or knockouts shall be provided in the structure as detailed on the plans.

Threaded inserts and pulling eyes shall be cast in as shown on the plans.

If the Contractor chooses to propose a different structural design, signed and sealed shop drawings, design calculations, and other information requested by the RPR shall be submitted by the Contractor to allow for a full evaluation by the RPR. The RPR shall review per the process defined in the General Provisions.

115-2.4 Junction boxes. Not Used.

115-2.5 Mortar. The mortar shall be composed of one part of cement and two parts of mortar sand, by volume. The cement shall be per the requirements in ASTM C150, Type I. The sand shall be per the requirements in ASTM C144. Hydrated lime may be added to the mixture of sand and cement in an amount not to exceed 15% of the weight of cement used. The hydrated lime shall meet the requirements of ASTM C206. Water shall be potable, reasonably clean and free of oil, salt, acid, alkali, sugar, vegetable, or other substances injurious to the finished product.

115-2.6 Concrete. Concrete shall be proportioned, placed, and cured per Item P-610, Concrete for Miscellaneous Structures.

115-2.7 Frames and covers. The frames shall conform to one of the following requirements:

a. ASTM A48 Gray iron castings

b. ASTM A47 Malleable iron castings

c. ASTM A27 Steel castings

d. ASTM A283, Grade D Structural steel for grates and frames

e. ASTM A536 Ductile iron castings

f. ASTM A897 Austempered ductile iron castings

All castings specified shall withstand a maximum tire pressure of **250** psi and maximum load of **100,000** lbs.

All castings or structural steel units shall conform to the dimensions shown on the plans and shall be designed to support the loadings specified.

Each frame and cover unit shall be provided with fastening members to prevent it from being dislodged by traffic, but which will allow easy removal for access to the structure.

All castings shall be thoroughly cleaned. After fabrication, structural steel units shall be galvanized to meet the requirements of ASTM A123.

Each cover shall have the word “ELECTRIC” or other approved designation cast on it. Each frame and cover shall be as shown on the plans or approved equivalent. No cable notches are required.

Each manhole shall be provided with a “DANGER -- PERMIT-REQUIRED CONFINED SPACE, DO NOT ENTER” safety warning sign as detailed in the Contract Documents and in accordance with OSHA 1910.146 (c)(2).

115-2.8 Ladders. Not Used.

115-2.9 Reinforcing steel. All reinforcing steel shall be deformed bars of new billet steel meeting the requirements of ASTM A615, Grade 60.

115-2.10 Bedding/special backfill. Bedding or special backfill shall be as shown on the plans.

115-2.11 Flowable backfill. Flowable material used to backfill shall conform to the requirements of Item P-153, Controlled Low Strength Material.

115-2.12 Cable trays. Cable trays shall be of plastic. Cable trays shall be located as shown on the plans.

115-2.13 Plastic conduit. Plastic conduit shall comply with Item L-110, Airport Underground Electrical Duct Banks and Conduits.

115-2.14 Conduit terminators. Conduit terminators shall be pre-manufactured for the specific purpose and sized as required or as shown on the plans.

115-2.15 Pulling-in irons. Not Used.

115-2.16 Ground rods. Ground rods shall be one piece, copper clad steel**.** The ground rods shall be of the length and diameter specified on the plans, but in no case shall they be less than 8 feet (2.4 m) long nor less than 5/8 inch (16 mm) in diameter.

CONSTRUCTION METHODS

115-3.1 Unclassified excavation. It is the Contractor's responsibility to locate existing utilities within the work area prior to excavation. Damage to utility lines, through lack of care in excavating, shall be repaired or replaced to the satisfaction of the RPR without additional expense to the Owner.

The Contractor shall perform excavation for structures and structure footings to the lines and grades or elevations shown on the plans or as staked by the RPR. The excavation shall be of sufficient size to permit the placing of the full width and length of the structure or structure footings shown.

All excavation shall be unclassified and shall be considered incidental to Item L-115. Dewatering necessary for structure installation and erosion per federal, state, and local requirements is incidental to Item L-115.

Boulders, logs and all other objectionable material encountered in excavation shall be removed. All rock and other hard foundation material shall be cleaned of all loose material and cut to a firm surface either level, stepped or serrated, as directed by the RPR. All seams, crevices, disintegrated rock and thin strata shall be removed. When concrete is to rest on a surface other than rock, special care shall be taken not to disturb the bottom of the excavation. Excavation to final grade shall not be made until just before the concrete or reinforcing is to be placed.

The Contractor shall provide all bracing, sheeting and shoring necessary to implement and protect the excavation and the structure as required for safety or conformance to governing laws. The cost of bracing, sheeting and shoring shall be included in the unit price bid for the structure.

Unless otherwise provided, bracing, sheeting and shoring involved in the construction of this item shall be removed by the Contractor after the completion of the structure. Removal shall be effected in a manner that will not disturb or mar finished masonry. The cost of removal shall be included in the unit price bid for the structure.

After each excavation is completed, the Contractor shall notify the RPR. Structures shall be placed after the RPR has approved the depth of the excavation and the suitability of the foundation material.

Prior to installation the Contractor shall provide a minimum of 6 inches (150 mm) of sand or a material approved by the RPR as a suitable base to receive the structure. The base material shall be compacted and graded level and at proper elevation to receive the structure in proper relation to the conduit grade or ground cover requirements, as indicated on the plans.

115-3.2 Concrete structures. Concrete structures shall be built on prepared foundations conforming to the dimensions and form indicated on the plans. The concrete and construction methods shall conform to the requirements specified in Item P-610. Any reinforcement required shall be placed as indicated on the plans and shall be approved by the RPR before the concrete is placed.

115-3.3 Precast unit installations. Precast units shall be installed plumb and true. Joints shall be made watertight by use of sealant at each tongue-and-groove joint and at roof of manhole. Excess sealant shall be removed and severe surface projections on exterior of neck shall be removed.

115-3.4 Placement and treatment of castings, frames and fittings. All castings, frames and fittings shall be placed in the positions indicated on the Plans or as directed by the RPR and shall be set true to line and to correct elevation. If frames or fittings are to be set in concrete or cement mortar, all anchors or bolts shall be in place and position before the concrete or mortar is placed. The unit shall not be disturbed until the mortar or concrete has set.

Field connections shall be made with bolts, unless indicated otherwise. Welding will not be permitted unless shown otherwise on the approved shop drawings and written approval is granted by the casting manufacturer. Erection equipment shall be suitable and safe for the workman. Errors in shop fabrication or deformation resulting from handling and transportation that prevent the proper assembly and fitting of parts shall be reported immediately to the RPR and approval of the method of correction shall be obtained. Approved corrections shall be made at Contractor’s expense.

Anchor bolts and anchors shall be properly located and built into connection work. Bolts and anchors shall be preset by the use of templates or such other methods as may be required to locate the anchors and anchor bolts accurately.

Pulling-in irons shall be located opposite all conduit entrances into structures to provide a strong, convenient attachment for pulling-in blocks when installing cables. Pulling-in irons shall be set directly into the concrete walls of the structure.

115-3.5 Installation of ladders. Not Used.

115-3.6 Removal of sheeting and bracing. In general, all sheeting and bracing used to support the sides of trenches or other open excavations shall be withdrawn as the trenches or other open excavations are being refilled. That portion of the sheeting extending below the top of a structure shall be withdrawn, unless otherwise directed, before more than 6 inches (150 mm) of material is placed above the top of the structure and before any bracing is removed. Voids left by the sheeting shall be carefully refilled with selected material and rammed tight with tools especially adapted for the purpose or otherwise as may be approved.

The RPR may direct the Contractor to delay the removal of sheeting and bracing if, in his judgment, the installed work has not attained the necessary strength to permit placing of backfill.

115-3.7 Backfilling. After a structure has been completed, the area around it shall be backfilled in horizontal layers not to exceed 6 inches (150 mm) in thickness measured after compaction to the density requirements in Item P-152. Each layer shall be deposited all around the structure to approximately the same elevation. The top of the fill shall meet the elevation shown on the plans or as directed by the RPR.

Backfill shall not be placed against any structure until approval is given by the RPR. In the case of concrete, such approval shall not be given until tests made by the laboratory under supervision of the RPR establish that the concrete has attained sufficient strength to provide a factor of safety against damage or strain in withstanding any pressure created by the backfill or the methods used in placing it.

Where required, the RPR may direct the Contractor to add, at his own expense, sufficient water during compaction to assure a complete consolidation of the backfill. The Contractor shall be responsible for all damage or injury done to conduits, duct banks, structures, property or persons due to improper placing or compacting of backfill.

115-3.8 Connection of duct banks. To relieve stress of joint between concrete-encased duct banks and structure walls, reinforcement rods shall be placed in the structure wall and shall be formed and tied into duct bank reinforcement at the time the duct bank is installed.

115-3.9 Grounding. A ground rod shall be installed in the floor of all concrete structures so that the top of rod extends 6 inches (150 mm) above the floor. The ground rod shall be installed within one foot (30 cm) of a corner of the concrete structure. Ground rods shall be installed prior to casting the bottom slab. Where the soil condition does not permit driving the ground rod into the earth without damage to the ground rod, the Contractor shall drill a 4-inch (100 mm) diameter hole into the earth to receive the ground rod. The hole around the ground rod shall be filled throughout its length, below slab, with Portland cement grout. Ground rods shall be installed in precast bottom slab of structures by drilling a hole through bottom slab and installing the ground rod. Bottom slab penetration shall be sealed watertight with Portland cement grout around the ground rod.

A grounding bus of 4/0 bare stranded copper shall be exothermically bonded to the ground rod and loop the concrete structure walls. The ground bus shall be a minimum of one foot (30 cm) above the floor of the structure and separate from other cables. No. 2 American wire gauge (AWG) bare copper pigtails shall bond the grounding bus to all cable trays and other metal hardware within the concrete structure. Connections to the grounding bus shall be exothermic. If an exothermic weld is not possible, connections to the grounding bus shall be made by using connectors approved for direct burial in soil or concrete per UL 467. Hardware connections may be mechanical, using a lug designed for that purpose.

115-3.10 Cleanup and repair. After erection of all galvanized items, damaged areas shall be repaired by applying a liquid cold-galvanizing compound per MIL-P-21035. Surfaces shall be prepared and compound applied per the manufacturer's recommendations.

Prior to acceptance, the entire structure shall be cleaned of all dirt and debris.

115-3.11 Restoration. After the backfill is completed, the Contractor shall dispose of all surplus material, dirt and rubbish from the site. The Contractor shall restore all disturbed areas equivalent to or better than their original condition. All sodding, grading and restoration shall be considered incidental to the respective Item L-115 pay item.

The Contractor shall grade around structures as required to provide positive drainage away from the structure.

Areas with special surface treatment, such as roads, sidewalks, or other paved areas shall have backfill compacted to match surrounding areas, and surfaces shall be repaired using materials comparable to original materials.

Following restoration of all trenching near airport movement surfaces, the Contractor shall thoroughly visually inspect the area for foreign object debris (FOD), and remove any such FOD that is found. This FOD inspection and removal shall be considered incidental to the pay item of which it is a component part.

After all work is completed, the Contractor shall remove all tools and other equipment, leaving the entire site free, clear and in good condition.

115-3.12 Inspection. Prior to final approval, the electrical structures shall be thoroughly inspected for conformance with the plans and this specification. Any indication of defects in materials or workmanship shall be further investigated and corrected. The earth resistance to ground of each ground rod shall not exceed 25 ohms. Each ground rod shall be tested using the fall-of-potential ground impedance test per

American National Standards Institute / Institute of Electrical and Electronic Engineers (ANSI/IEEE) Standard 81. This test shall be performed prior to establishing connections to other ground electrodes.

115-3.13 Manhole elevation adjustments. The Contractor shall adjust the tops of existing manholes in areas designated in the Contract Documents to the new elevations shown. The Contractor shall be responsible for determining the exact height adjustment required to raise or lower the top of each manhole to the new elevations. The existing top elevation of each manhole to be adjusted shall be determined in the field and subtracted/added from the proposed top elevation.

The Contractor shall remove/extend the existing top section or ring and cover on the manhole structure or manhole access. The Contractor shall install precast concrete sections or grade rings of the required dimensions to adjust the manhole top to the new proposed elevation or shall cut the existing manhole walls to shorten the existing structure, as required by final grades. The Contractor shall reinstall the manhole top section or ring and cover on top and check the new top elevation.

The Contractor shall construct a concrete slab around the top of adjusted structures located in graded areas that are not to be paved. The concrete slab shall conform to the dimensions shown on the plans.

115-3.14 Duct extension to existing ducts. Where existing concrete encased ducts are to be extended, the duct extension shall be concrete encased plastic conduit. The fittings to connect the ducts together shall be standard manufactured connectors designed and approved for the purpose. The duct extensions shall be installed according to the concrete encased duct detail and as shown on the plans.

METHOD OF MEASUREMENT

115-4.1 Manhole elevation adjustments shall be measured by the completed unit installed, in place, completed, and accepted. Separate measurement shall not be made for the various types and sizes.

BASIS OF PAYMENT

115-5.1 Payment shall be made at the contract unit price for manhole elevation adjustments. This price shall be full compensation for furnishing all materials and for all preparation, assembly, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary, including but not limited to, spacers, concrete, rebar, dewatering, excavating, backfill, topsoil, sodding and pavement restoration, where required, to complete this item as shown in the plans and to the satisfaction of the RPR.

Payment will be made under:

Item L-115-5.1	Existing Electrical Manhole/Junction Structure Elevation Adjustment – Per Each

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.

American National Standards Institute / Insulated Cable Engineers Association (ANSI/ICEA)

ANSI/IEEE STD 81	IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System

Advisory Circular (AC)

AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits

AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-42	Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories
AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-53	Airport Lighting Equipment Certification Program

Commercial Item Description (CID)

A-A 59544	Cable and Wire, Electrical (Power, Fixed Installation)

ASTM International (ASTM)

ASTM A27	Standard Specification for Steel Castings, Carbon, for General Application
ASTM A47	Standard Specification for Ferritic Malleable Iron Castings
ASTM A48	Standard Specification for Gray Iron Castings
ASTM A123	Standard Specification for Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products
ASTM A283	Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
ASTM A536	Standard Specification for Ductile Iron Castings
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A897	Standard Specification for Austempered Ductile Iron Castings
ASTM C144	Standard Specification for Aggregate for Masonry Mortar
ASTM C150	Standard Specification for Portland Cement
ASTM C206	Standard Specification for Finishing Hydrated Lime

FAA Engineering Brief (EB)

EB #83	In Pavement Light Fixture Bolts

Mil Spec

MIL-P-21035	Paint High Zinc Dust Content, Galvanizing Repair

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)

END OF ITEM L-115

Item L-125 Installation of Airport Lighting Systems

DESCRIPTION

125-1.1 This item shall consist of airport lighting systems furnished and installed in accordance with this specification, the referenced specifications, and the applicable advisory circulars (ACs). The systems shall be installed at the locations and in accordance with the dimensions, design, and details shown in the plans. This item shall include the furnishing of all equipment, materials, services, and incidentals necessary to place the systems in operation as completed units to the satisfaction of the RPR.

EQUIPMENT AND MATERIALS

125-2.1 General.

a. Airport lighting equipment and materials covered by Federal Aviation Administration (FAA) specifications shall be certified under the Airport Lighting Equipment Certification Program in accordance with AC 150/5345-53, current version. FAA certified airfield lighting shall be compatible with each other to perform in compliance with FAA criteria and the intended operation. If the Contractor provides equipment that does not performs as intended because of incompatibility with the system, the Contractor assumes all costs to correct the system for to operate properly.

b. Manufacturer's certifications shall not relieve the Contractor of their responsibility to provide materials in accordance with these specifications and acceptable to the RPR. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the RPR and replaced with materials, which do comply with these specifications, at the sole cost of the Contractor.

c. All materials and equipment used shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Clearly mark each copy to identify pertinent products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be clearly made with arrows or circles (highlighting is not acceptable). The Contractor shall be responsible for delays in the project accruing directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be submitted in electronic PDF format, tabbed by specification section. The RPR reserves the right to reject any or all equipment, materials or procedures, which, in the RPR’s opinion, does not meet the system design and the standards and codes, specified herein.

e. All LED light fixtures, with the exception of obstruction lighting (AC 150/5345-43) must be warranted by the manufacturer for a minimum of 4 years after date of installation inclusive of all electronics. Obstruction lighting warranty is set by the individual manufacturer. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The

defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

EQUIPMENT AND MATERIALS

125-2.2 Conduit/Duct. Conduit shall conform to Specification Item L-110 Airport Underground Electrical Duct Banks and Conduits.

125-2.3 Cable and Counterpoise. Cable and Counterpoise shall conform to Item L-108 Underground Power Cable for Airports.

125-2.4 Tape. Rubber and plastic electrical tapes shall be Scotch Electrical Tape Numbers 23 and 88 respectively, as manufactured by 3M Company or an approved equal.

125-2.5 Cable Connections. Cable Connections shall conform to Item L-108 Installation of Underground Cable for Airports.

125-2.6 Retroreflective Markers. Not required.

125-2.7 Runway and Taxiway Lights. Runway and taxiway lights shall conform to the requirements of AC 150/5345-46. Lamps shall be of size and type indicated, or as required by fixture manufacturer for each lighting fixture required under this contract. Filters shall be of colors conforming to the specification for the light concerned or to the standard referenced.

Lights

Type	Class	Mode	Style	Option	Base	Filter	Transformer	Notes
l-861T	2	1	N/A		L-867	Blue		

125-2.8 Runway and Taxiway Signs. Not Used.

125-2.9 Runway End Identifier Light (REIL). Not required.

125-2.10 Precision Approach Path Indicator (PAPI). Not required

125-2.11 Circuit Selector Cabinet. Not Used

125-2.12 Light Base and Transformer Housings. Light Base and Transformer Housings should conform to the requirements of AC 150/5345-42. Light bases shall be Type L-867, Class 1A, Size B shall be provided as indicated or as required to accommodate the fixture or device installed thereon. Base plates, cover plates, and adapter plates shall be provided to accommodate various sizes of fixtures.

125-2.13 Isolation Transformers. Isolation Transformers shall be Type L-830 , size as required for each installation. Transformer shall conform to AC 150/5345-47.

INSTALLATION

125-3.1 Installation. The Contractor shall furnish, install, connect and test all equipment, accessories, conduit, cables, wires, buses, grounds and support items necessary to ensure a complete and operable airport lighting system as specified here and shown in the plans.

The equipment installation and mounting shall comply with the requirements of the National Electrical Code and state and local code agencies having jurisdiction.

The Contractor shall install the specified equipment in accordance with the applicable advisory circulars and the details shown on the plans.

125-3.2 Testing. All lights shall be fully tested by continuous operation for not less than 24 hours as a completed system prior to acceptance. The test shall include operating the constant current regulator in each step not less than 10 times at the beginning and end of the 24-hour test. The fixtures shall illuminate properly during each portion of the test.

125-3.3 Shipping and Storage. Equipment shall be shipped in suitable packing material to prevent damage during shipping. Store and maintain equipment and materials in areas protected from weather and physical damage. Any equipment and materials, in the opinion of the RPR, damaged during construction or storage shall be replaced by the Contractor at no additional cost to the owner. Painted or galvanized surfaces that are damaged shall be repaired in accordance with the manufacturer's recommendations.

125-3.4 Elevated and In-pavement Lights. Water, debris, and other foreign substances shall be removed prior to installing fixture base and light.

A jig or holding device shall be used when installing each light fixture to ensure positioning to the proper elevation, alignment, level control, and azimuth control. Light fixtures shall be oriented with the light beams parallel to the runway or taxiway centerline and facing in the required direction. The outermost edge of fixture shall be level with the surrounding pavement. Surplus sealant or flexible embedding material shall be removed. The holding device shall remain in place until sealant has reached its initial set.

METHOD OF MEASUREMENT

125-4.1 Runway and taxiway lights will be measured by the number of each type installed or removed as completed units in place, ready for operation, and accepted by the RPR.

125-4.2 Guidance signs or abandoned guidance sign foundations will be measured by the number of each removed as completed units and accepted by the RPR.

BASIS OF PAYMENT

125-5.1 Furnish and Install L-861T Taxiway Elevated Edge Light Fixture and New L-867B Light Base in Paved Shoulder. Payment will be made at the Contract unit price for each complete LED L-861T(L) elevated taxiway edge light, including excavation, light base core drilling, placement and jigging of light base, and connection of threaded conduit hubs, concrete light base foundation, extension collar, spacer rings, P-606 sealant for top section, P-605 sealant for spacer rings, hardware, temporary mud plate and plywood plate, pilot core drilling and extension collar core drilling, ground rod, ground conductors, and ground connections, light base ground lug, isolation transformer, connector and splicing material, installed in asphalt pavement by the Contractor and accepted by the RPR. This payment will be full compensation for furnishing all materials, and for all preparation, assembly, and installation of these materials, testing, and for all labor, equipment, tools, and incidentals necessary to complete this item.

125-5.2 Reinstall Stored L-861T Elevated Taxiway Edge Light Fixture and Isolation Transformer on Adjusted Light Base in Paved Shoulder. Payment will be made at the Contract unit price for each complete stored L-861T(L) elevated taxiway edge light and isolation transformer, including extension collar, spacer rings, P-606 sealant for top section, P-605 sealant for spacer rings, hardware, temporary mud plate and plywood plate, pilot core drilling and extension collar core drilling, ground conductors, and ground connections, connector and splicing material, installed in asphalt pavement by the Contractor and accepted by the RPR. This payment will be full compensation for furnishing all materials, and for all

preparation, assembly, and installation of furnished materials and stored fixture and transformer, testing, and for all labor, equipment, tools, and incidentals necessary to complete this item.

125-5.3 Reinstall Stored L-804 Elevated Runway Guard Light Fixture and Isolation Transformer on Adjusted Light Base in Paved Shoulder. Payment will be made at the Contract unit price for each complete stored L-804 elevated runway guard light and isolation transformer, including extension collar, spacer rings, P-606 sealant for top section, P-605 sealant for spacer rings, hardware, temporary mud plate and plywood plate, pilot core drilling and extension collar core drilling, ground conductors, and ground connections, connector and splicing material, installed in asphalt pavement by the Contractor and accepted by the RPR. This payment will be full compensation for furnishing all materials, and for all preparation, assembly, and installation of furnished materials and stored fixture and transformer, testing, and for all labor, equipment, tools, and incidentals necessary to complete this item.

125-5.4 Furnish and Install Cover Plate on Adjusted Light Base in Paved Shoulder. Payment will be made at the Contract unit price for each complete cover plate installation, including extension collar, spacer rings, P-606 sealant for top section, P-605 sealant for spacer rings, hardware, temporary mud plate and plywood plate, pilot core drilling and extension collar core drilling, ground conductors, and ground connections, connector and splicing material, installed in asphalt pavement by the Contractor and accepted by the RPR. This payment will be full compensation for furnishing all materials, and for all preparation, assembly, and installation of furnished materials, testing, and for all labor, equipment, tools, and incidentals necessary to complete this item

125-5.5 Removal of L-861T Elevated Taxiway Edge Light Fixture, Isolation Transformer, Extension Collar, and Accessories on Existing Light Base to Remain in Paved Shoulder. Storage of Fixture and Transformer. Payment will be made at the Contract unit price for each removal of L-861T elevated taxiway edge light, isolation transformer removal, hardware removal, grounding removal, extension collar removal, spacer ring removal, and all associated equipment removal by the Contractor and accepted by the RPR. This payment will be full compensation for furnishing all materials, removal and disposal of existing materials, and for all preparation, assembly, and storage of existing light fixture and isolation transformer for future installation, and for all labor, equipment, tools, and incidentals necessary to complete this item.

125-5.6 Removal of L-804 Elevated Runway Guard Light Fixture, Isolation Transformer, Extension Collar, and Accessories on Existing Light Base to Remain in Paved Shoulder. Storage of Fixture and Transformer. Payment will be made at the Contract unit price for each removal of L-804 elevated runway guard light, isolation transformer removal, hardware removal, grounding removal, extension collar removal, spacer ring removal, and all associated equipment removal by the Contractor and accepted by the RPR. This payment will be full compensation for furnishing all materials, removal and disposal of existing materials, and for all preparation, assembly, and storage of existing light fixture and isolation transformer for future installation, and for all labor, equipment, tools, and incidentals necessary to complete this item.

125-5.7 Removal of Light Base and Accessories. Payment will be made at the Contract unit price for each removal of light base, including excavation, removal of light base and concrete foundation, hardware removal, grounding removal, backfilling, and all associated equipment removal by the Contractor and accepted by the RPR. This payment will be full compensation for furnishing all materials, removal and disposal of existing materials, and for all preparation, assembly, and for all labor, equipment, tools, and incidentals necessary to complete this item.

125-5.8 Demolition of Abandoned Guidance Sign Foundation. Payment will be made at the Contract unit price for each removed guidance sign foundation, including ground rod, ground cable, and ground connection, cover plate, transformer, connector and splicing material, mounting hardware, and concrete foundation, and accepted by the RPR. This payment will be full compensation for furnishing all materials

and for all preparation, assembly, and removal of the existing equipment, and for all labor, equipment, tools and incidentals necessary to complete this item.

125-5.9 Removal of Existing Guidance and Demolition of Guidance Sign Foundation. Payment will be made at the Contract unit price for each removal of existing guidance sign and associated foundation, including excavation, removal of guidance sign and associated equipment, concrete foundation, hardware removal, grounding removal, backfilling, and all associated equipment removal by the Contractor and accepted by the RPR. This payment will be full compensation for furnishing all materials, removal and disposal of existing materials, and for all preparation, assembly, and for all labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

L-125-5.1	Furnish and Install L-861T Taxiway Elevated Edge Light Fixture and New L-867B Light Base in Paved Shoulder - per each
L-125-5.2	Reinstall Stored L-861T Elevated Taxiway Edge Light Fixture and Isolation Transformer on Adjusted Light Base in Paved Shoulder - per each
L-125-5.3	Reinstall Stored L-804 Elevated Runway Guard Light Fixture and Isolation Transformer on Adjusted Light Base in Paved Shoulder - per each
L-125-5.4	Furnish and Install Cover Plate on Adjusted Light Base in Paved Shoulder- per each
L-125-5.5	Removal of L-861T Elevated Taxiway Edge Light Fixture, Isolation Transformer, Extension Collar, and Accessories on Existing Light Base to Remain in Paved Shoulder. Storage of Fixture and Transformer - per each
L-125-5.6	Removal of L-804 Elevated Runway Guard Light Fixture, Isolation Transformer, Extension Collar, and Accessories on Existing Light Base to Remain in Paved Shoulder. Storage of Fixture and Transformer - per each
L-125-5.7	Removal of Light Base and Accessories - per each
L-125-5.8	Demolition of Abandoned Guidance Sign Foundation - per each
L-125-5.9	Removal of Existing Guidance and Demolition of Guidance Sign Foundation - per each

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 150/5340-18	Standards for Airport Sign Systems
AC 150/5340-26	Maintenance of Airport Visual Aid Facilities

AC 150/5340-30	Design and Installation Details for Airport Visual Aids
AC 150/5345-5	Circuit Selector Switch
AC 150/5345-7	Specification for L-824 Underground Electrical Cable for Airport Lighting Circuits
AC 150/5345-26	Specification for L-823 Plug and Receptacle, Cable Connectors
AC 150/5345-28	Precision Approach Path Indicator (PAPI) Systems
AC 150/5345-39	Specification for L-853, Runway and Taxiway Retroreflective Markers
AC 150/5345-42	Specification for Airport Light Bases, Transformer Housings, Junction Boxes, and Accessories
AC 150/5345-44	Specification for Runway and Taxiway Signs
AC 150/5345-46	Specification for Runway and Taxiway Light Fixtures
AC 150/5345-47	Specification for Series to Series Isolation Transformers for Airport Lighting Systems
AC 150/5345-51	Specification for Discharge-Type Flashing Light Equipment
AC 150/5345-53	Airport Lighting Equipment Certification Program
Engineering Brief (EB)	
EB No. 67	Light Sources Other than Incandescent and Xenon for Airport and Obstruction Lighting Fixtures

END OF ITEM L-125

Item L-130 Pavement Surface Condition Sensor

DESCRIPTION

130-1.1 This item shall consist of in-pavement surface condition sensor and associated cabling furnished and installed in accordance with this specification, the referenced specifications, the applicable standards/recommend practices. The systems shall be installed at the locations and in accordance with the dimensions, design, and details shown in the plans as well as the recommendations of the equipment manufacturer. This item shall include the furnishing of all equipment, materials, services, and incidentals necessary to place the systems in operation as completed units to the satisfaction of the RPR.

EQUIPMENT AND MATERIALS

130-2.1 General.

a. Airport lighting equipment and materials covered by Federal Aviation Administration (FAA) specifications shall be certified under the Airport Lighting Equipment Certification Program in accordance with AC 150/5345-53, current version. FAA certified airfield lighting shall be compatible with each other to perform in compliance with FAA criteria and the intended operation. If the Contractor provides equipment that does not performs as intended because of incompatibility with the system, the Contractor assumes all costs to correct the system for to operate properly.

b. Manufacturer's certifications shall not relieve the Contractor of their responsibility to provide materials in accordance with these specifications and acceptable to the RPR. Materials supplied and/or installed that do not comply with these specifications shall be removed, when directed by the RPR and replaced with materials, which do comply with these specifications, at the sole cost of the Contractor.

c. All materials and equipment used shall be submitted to the RPR for approval prior to ordering the equipment. Submittals consisting of marked catalog sheets or shop drawings shall be provided. Clearly mark each copy to identify pertinent products or models applicable to this project. Indicate all optional equipment and delete non-pertinent data. Submittals for components of electrical equipment and systems shall identify the equipment for which they apply on each submittal sheet. Markings shall be clearly made with arrows or circles (highlighting is not acceptable). The Contractor shall be responsible for delays in the project accruing directly or indirectly from late submissions or resubmissions of submittals.

d. The data submitted shall be sufficient, in the opinion of the RPR, to determine compliance with the plans and specifications. The Contractor's submittals shall be submitted in electronic PDF format, tabbed by specification section. The RPR reserves the right to reject any or all equipment, materials or procedures, which, in the RPR’s opinion, does not meet the system design and the standards and codes, specified herein.

e. All equipment and materials furnished and installed under this section shall be guaranteed against defects in materials and workmanship for a period of at least twelve (12) months from final acceptance by the Owner. The defective materials and/or equipment shall be repaired or replaced, at the Owner's discretion, with no additional cost to the Owner.

130-2.2 Remote Processing Unit. Existing system and Remote Processing Unit (RPU) is manufactured and serviced by Vaisala.

130-2.3 Surface Sensors. Surface sensors shall be manufactured by Vaisala.

130-2.4 Cable. Cable shall be Vaisala Type IIA multi-conductor cable. Extension cabling shall be Vaisala Type V multi-conductor cable.

130-2.5 Cable Connections. Cable Connections/Splices shall be as recommended by the manufacturer.

130-2.6 Conduit/Duct. Conduit shall conform to Specification Item L-110 Airport Underground Electrical Duct Banks and Conduits.

INSTALLATION

130-3.1 Installation. The Contractor shall furnish, install, connect and test all equipment, accessories, conduit, cables, wires, and support items necessary to ensure a complete and operable Pavement Surface Condition Sensor system as specified here and shown in the plans. All installation of the sensor(s), cabling, splicing, and encapsulation shall be witnessed by a representative from Vaisala.

The equipment installation and mounting shall comply with the requirements of the National Electrical Code and state and local code agencies having jurisdiction.

The Contractor shall install the specified equipment in accordance with the applicable advisory circulars, ARP5533 Revision B, and the details shown on the plans.

The total length of Type IIA and Type V cable installation shall not exceed 5,000 LF and shall only contain a single splice point at the Type IIA and Type V cable interfacing structure.

130-3.2 Testing/Calibration/Commissioning. All testing, calibration, and commissioning shall be per the requirements of the manufacturer and shall be witnessed by a representative from Vaisala. The contractor shall coordinate commissioning directly with Vaisala.

130-3.3 Shipping and Storage. Equipment shall be shipped in suitable packing material to prevent damage during shipping. Store and maintain equipment and materials in areas protected from weather and physical damage. Any equipment and materials, in the opinion of the RPR, damaged during construction or storage shall be replaced by the Contractor at no additional cost to the owner.

METHOD OF MEASUREMENT

130-4.1 Surface sensor installation and removal shall be measured per each sensor and associated Type IIA cable length units in place, ready for operation, and accepted by the RPR.

130-4.2 Type V Cable installed in duct bank or conduit shall be measured by the number of linear feet installed in place, ready for operation, and accepted by the RPR. This measurement shall include additional quantities for slack.

BASIS OF PAYMENT

130-5.1 Furnish and Install Surface Sensor and Type IIA Cable. Payment will be made at the Contract unit price for each complete Surface Sensor and Type IIA Cable assembly, including excavation, core drilling, saw cutting, surface sensor encapsulation, connector and splicing material, installed in asphalt pavement by the Contractor and accepted by the RPR. This payment will be full compensation for

furnishing all materials, and for all preparation, assembly, and installation of these materials, testing, and for all labor, equipment, tools, and incidentals necessary to complete this item.

130-5.2 Furnish and Install Vaisala Type V Cable in Duct Bank or Conduit. Payment will be made at the contract unit price for No. 8 AWG, 1/C, 5kV, L-824 Type C Cable, installed in duct bank or conduit, in place by the Contractor and accepted by the RPR. This price shall be full compensation for furnishing all materials and for all preparation and installation of these materials, and for all labor, equipment, tools, testing, and incidentals, including cable pulling tape/rope/pull cord and connections, conduit mandrel, conduit piston, and cable splices/connections, necessary to complete this item.

130-5.3 Remove Existing Surface Sensor and Type IIA Cable. Payment will be made at the Contract unit price for each removal of Surface Sensor and Type IIA Cable assembly, including excavation, removal of cable, splice removal, and all associated equipment removal by the Contractor and accepted by the RPR. This payment will be full compensation for furnishing all materials, removal and disposal of existing materials, and for all preparation, assembly, and for all labor, equipment, tools, and incidentals necessary to complete this item.

130-5.4 Pavement Surface Sensor Commissioning. Payment will be made at the Contract Lump Sum price for the oversite, testing, calibration, and commissioning of surface sensor system, and all associated equipment. This payment will be full compensation for procuring the manufacturer services and furnishing all materials, and for all preparation, labor, equipment, tools, and incidentals necessary to complete this item.

Payment will be made under:

L-130-5.1	Furnish and Install Surface Sensor and Type IIA Cable - per each
L-130-5.2	Furnish and Install Vaisala Type V Cable in Duct Bank or Conduit - per linear foot
L-130-5.3	Remove Existing Surface Sensor and Type IIA Cable - per each
L-130-5.4	Pavement Surface Sensor Commissioning – 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.

Advisory Circulars (AC)

AC 150/5345-53	Airport Lighting Equipment Certification Program

National Fire Protection Association (NFPA)

NFPA-70	National Electrical Code (NEC)
NFPA-780	Standard for the Installation of Lightning Protection Systems

Society of Automotive Engineers (SAE) International

APR5533B	Stationary Runway Weather Information System (In-Pavement)

END OF ITEM L-130

Item P-101 Preparation/Removal of Existing Pavements

DESCRIPTION

101-1 This item shall consist of preparation of existing pavement surfaces for overlay, surface treatments, removal of existing pavement, and other miscellaneous items. The work shall be accomplished in accordance with these specifications and the applicable plans.

EQUIPMENT AND MATERIALS

101-2 All equipment and materials shall be specified here and in the following paragraphs or approved by the Resident Project Representative (RPR). The equipment shall not cause damage to the pavement to remain in place.

CONSTRUCTION

101-3.1 Removal of existing pavement.

The Contractor's removal operation shall be controlled to not damage adjacent pavement structure, and base material, cables, utility ducts, pipelines, or drainage structures which are to remain under the pavement.

a. Concrete pavement removal. Full depth saw cuts shall be made perpendicular to the slab surface. The Contractor shall saw through the full depth of the slab including any dowels at the joint, removing the pavement and installing new dowels as shown on the plans and per the specifications. Where the perimeter of the removal limits is not located on the joint and there are no dowels present, the perimeter shall be saw cut the full depth of the pavement. The pavement inside the saw cut shall be removed by methods which will not cause distress in the pavement which is to remain in place. If the material is to be wasted on the airport site, it shall be reduced to a maximum size of **3"**. Concrete slabs that are damaged by under breaking shall be repaired or removed and replaced as directed by the RPR.

The edge of existing concrete pavement against which new pavement abuts shall be protected from damage at all times. Spall and underbreak repair shall be in accordance with the plans. Any underlaying material that is to remain in place, shall be recompacted and/or replaced as shown on the plans. Adjacent areas damaged during repair shall be repaired or replaced at the Contractor's expense.

b. Asphalt pavement removal. Asphalt pavement to be removed shall be cut to the full depth of the asphalt pavement around the perimeter of the area to be removed. If the material is to be wasted on the airport site, it shall be broken to a maximum size of **4** inches. **c. Repair or removal of Base, Subbase, and/or Subgrade.** All failed material including surface, base course, subbase course, and subgrade shall be removed and repaired as shown on the plans or as directed by the RPR. Materials and methods of construction shall comply with the applicable sections of these specifications. Any damage caused by Contractor's removal process shall be repaired at the Contractor's expense.

101-3.2 Preparation of joints and cracks prior to overlay/surface treatment. Remove all vegetation and debris from cracks to a minimum depth of 1 inch. If extensive vegetation exists, treat the specific area with a concentrated solution of a water-based herbicide approved by the RPR. Fill all cracks greater than 1/4 inch wide) with a crack sealant per ASTM D6690. The crack sealant, preparation, and application shall be compatible with the surface treatment/overlay to be used. To minimize contamination of the asphalt with the crack sealant, underfill the crack sealant a minimum of 1/8 inch, not to exceed ¼ inch. Any excess joint or crack sealer shall be removed from the pavement surface.

Wider cracks (over 1-1/2 inch wide), along with soft or sunken spots, indicate that the pavement or the pavement base should be repaired or replaced as stated below.

Cracks and joints may be filled with a mixture of emulsified asphalt and aggregate. The aggregate shall consist of limestone, volcanic ash, sand, or other material that will cure to form a hard substance. The combined gradation shall be as shown in the following table.

Gradation

Sieve Size	Percent Passing
No. 4 (4.75 mm)	100
No. 8 (2.36 mm)	90-100
No. 16 (1.18 mm)	65-90
No. 30 (600 µm)	40-60
No. 50 (300 µm)	25-42
No. 100 (150 µm)	15-30
No. 200 (75 µm)	10-20

Up to 3% cement can be added to accelerate the set time. The mixture shall not contain more than 20% natural sand without approval in writing from the RPR.

The proportions of asphalt emulsion and aggregate shall be determined in the field and may be varied to facilitate construction requirements. Normally, these proportions will be approximately one part asphalt emulsion to five parts aggregate by volume. The material shall be poured or placed into the joints or cracks and compacted to form a voidless mass. The joint or crack shall be filled to within +0 to -1/8 inches of the surface. Any material spilled outside the width of the joint shall be removed from the pavement surface prior to constructing the overlay. Where concrete overlays are to be constructed, only the excess joint material on the pavement surface and vegetation in the joints need to be removed.

101-3.3 Removal of Foreign Substances/contaminates prior to overlay and remarking. Removal of foreign substances/contaminates from existing pavement that will affect the bond of the new treatment shall consist of removal of rubber, fuel spills, oil, crack sealer, at least 90% of paint, and other foreign substances from the surface of the pavement. Areas that require removal are designated on the plans and as directed by the RPR in the field during construction.

high-pressure water cold milling rotary grinding **or** sandblasting may be used. If chemicals are used, they shall comply with the state's environmental protection regulations. Removal methods used shall not cause major damage to the pavement, or to any structure or utility within or adjacent to the work area. Major damage is defined as changing the properties of the pavement, removal of asphalt causing the aggregate to ravel, or removing pavement over 1/8 inch (3 mm) deep. If it is deemed by the RPR that damage to the existing pavement is caused by operational error, such as permitting the application method to dwell in one location for too long, the Contractor shall repair the damaged area without compensation and as directed by the RPR.

Removal of foreign substances shall not proceed until approved by the RPR. Water used for high-pressure water equipment shall be provided by the Contractor at the Contractor's expense. No material shall be deposited on the pavement shoulders. All waste shall be disposed of in areas indicated in this specification or shown on the plans.

101-3.4 Concrete spall or failed asphaltic concrete pavement repair.

Not applicable

101-3.5 Cold milling. Milling shall be performed with a power-operated milling machine or grinder, capable of producing a uniform finished surface. The milling machine or grinder shall operate without

tearing or gouging the underlaying surface. The milling machine or grinder shall be equipped with grade and slope controls, and a positive means of dust control. All millings shall be removed and disposed of off site except for the first 3,000 CY will remain property of the airport and shall be placed in a location on airport as designated by the RPR. If the Contractor mills or grinds deeper or wider than the plans specify, the Contractor shall replace the material removed with new material at the Contractor's Expense.

a. Patching. The milling machine shall be capable of cutting a vertical edge without chipping or spalling the edges of the remaining pavement and it shall have a positive method of controlling the depth of cut. The RPR shall layout the area to be milled with a straightedge in increments of 1-foot widths. The area to be milled shall cover only the failed area. Any excessive area that is milled because the Contractor doesn't have the appropriate milling machine, or areas that are damaged because of his negligence, shall be repaired by the Contractor at the Contractor's Expense.

b. Profiling, grade correction, or surface correction. The milling machine shall have a minimum width of 7 feet and it shall be equipped with electronic grade control devices that will cut the surface to the grade specified. The tolerances shall be maintained within +0 inch and -1/4 inch of the specified grade. The machine must cut vertical edges and have a positive method of dust control. The machine must have the ability to remove the millings or cuttings from the pavement and load them into a truck. All millings shall be removed and disposed of in areas designated on the plans.

c. Clean-up. The Contractor shall sweep the milled surface daily and immediately after the milling until all residual materials are removed from the pavement surface. Prior to paving, the Contractor shall wet down the milled pavement and thoroughly sweep and/or blow the surface to remove loose residual material. Waste materials shall be collected and removed from the pavement surface and adjacent areas by sweeping or vacuuming. Waste materials shall be removed and disposed in areas designated on the plans.

101-3.6. Preparation of asphalt pavement surfaces prior to surface treatment. Not used.**101-3.7 Maintenance**. The Contractor shall perform all maintenance work necessary to keep the pavement in a satisfactory condition until the full section is complete and accepted by the RPR. The surface shall be kept clean and free from foreign material. The pavement shall be properly drained at all times. If cleaning is necessary or if the pavement becomes disturbed, any work repairs necessary shall be performed at the Contractor's expense.

101-3.8 Preparation of Joints in Rigid Pavement prior to resealing. Not used.

101-3.8.1 Removal of Existing Joint Sealant. Not used.

101-3.8.2 Cleaning prior to sealing. Not used.

101-3.8.3 Joint sealant. Not used.

101-3.9 Preparation of Cracks in Flexible Pavement prior to sealing. Prior to application of sealant material, clean and dry the joints of all scale, dirt, dust, old sealant, curing compound, moisture and other foreign matter. The Contractor shall demonstrate, in the presence of the RPR, that the method used cleans the cracks and does not damage the pavement.

101-3.9.1 Preparation of Crack. Widen crack with random crack saw by removing a minimum of 1/16 inch from each side of crack. Immediately before sealing, cracks will be blown out with a hot air lance combined with oil and water-free compressed air.

101-3.9.2 Removal of Existing Crack Sealant. Existing sealants will be removed by random crack saw. Following sawing any remaining debris will be removed by use of a hot lance combined with oil and water-free compressed air.

101-3.9.3 Crack Sealant. Crack sealant material and installation will be in accordance with Item P-605.

101-3.9.4 Removal of Pipe and other Buried Structures.

a. Removal of Existing Pipe Material. Remove the types of pipe as indicated on the plans. The pipe material shall be legally disposed of off-site in a timely manner following removal. Trenches shall be backfilled with material equal to or better in quality than adjacent embankment. Trenches under paved areas must be compacted to 95% of ASTM D1557.

b. Removal of Inlets/Manholes/ Underdrain Clean-Outs. Where indicated on the plans or as directed by the RPR, inlets and/or underdrain clean-outs and manholes shall be removed and legally disposed of off-site in a timely fashion after removal. Excavations after removal shall be backfilled with material equal or better in quality than adjacent embankment. When under paved areas must be compacted to 95% of ASTM D1557, when outside of paved areas must be compacted to 95% of ASTM D698.

METHOD OF MEASUREMENT

101-4.1 Pavement removal. The unit of measurement for pavement removal shall be the number of square yards removed by the Contractor. Any pavement removed outside the limits of removal because the pavement was damaged by negligence on the part of the Contractor shall not be included in the measurement for payment. No direct measurement or payment shall be made for saw cutting of concrete or asphalt pavement. Saw cutting shall be incidental to pavement removal.

101-4.2 Joint and crack repair. The unit of measurement for joint and crack repair shall be the linear foot of joint.

101-4.3 Cold milling. The unit of measure for cold milling shall be minimum 2 inches of milling per square yard. The location and average depth of the cold milling shall be as shown on the plans. If the initial cut does not correct the condition, the Contractor shall re-mill the area and will be paid for the total depth of milling.

101-4.4 Remove Existing Drainage Structure. Remove Existing Drainage Structure shall be measured on the basis of the number of inlets or manholes removed.

101-4.5 Remove Existing Storm Drain. Remove Existing Storm Drain, any size shall be measured on the basis of the number of linear feet of pipe removed.

101-4.6 Remove Existing Underdrain Cleanout Structure. Remove Existing Underdrain Cleanout Structure shall be measured on the basis of the number of cleanout structures removed.

101-4.7 Remove Existing 6” Underdrain. Remove Existing 6” Underdrain shall be measured on the basis of the number of linear feet of underdrain removed.

BASIS OF PAYMENT

101-5.1 Payment. Payment shall be made at contract unit price for the unit of measurement as specified above. This price shall be full compensation for furnishing all materials and for all preparation, hauling, and placing of the material and for all labor, equipment, tools, and incidentals necessary to complete this item.

Item P 101-5.1	Pavement Removal – per square yard
Item P 101-5.2	Cold Milling Bituminous Pavement 0-4 Inches – per square yard
Item P 101-5.3	Cold Milling Bituminous Pavement 4-6 Inches – per square yard
Item P 101-5.4	Cold Milling Bituminous Pavement 6-8 Inches – per square yard

Item P 101-5.5 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.

Advisory Circulars (AC)

AC 150/5380-6 Guidelines and Procedures for Maintenance of Airport Pavements.

ASTM International (ASTM)

ASTM D6690 Standard Specification for Joint and Crack Sealants, Hot Applied, for Concrete and Asphalt Pavements

END OF ITEM P-101

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Item P-152 Excavation, Subgrade, and Embankment

DESCRIPTION

152-1.1 This item covers excavation, disposal, placement, and compaction of all materials within the limits of the work required to construct safety areas, runways, taxiways, aprons, and intermediate areas as well as other areas for drainage, building construction, parking, or other purposes in accordance with these specifications and in conformity to the dimensions and typical sections shown on the plans.

152-1.2 Classification. All material excavated shall be classified as defined below:

a. Unclassified excavation. Unclassified excavation shall consist of the excavation and reuse or disposal of all material, regardless of its nature.

152-1.3 PFAS impacted soil excavation. PFAS impacted material shall be disposed in designated waste areas as shown on the plans in a manner in accordance with X-802 HDPE Liner System.

CONSTRUCTION METHODS

152-2.1 General. Before beginning excavation, grading, and embankment operations in any area, the area shall be cleared or cleared and grubbed in accordance with Item P-151.

The suitability of material to be placed in embankments shall be subject to approval by the RPR. All unsuitable material shall be disposed of in waste areas as shown on the plans. All waste areas shall be graded to allow positive drainage of the area and adjacent areas. The surface elevation of waste areas shall be specified on the plans or approved by the RPR.

When the Contractor's excavating operations encounter artifacts of historical or archaeological significance, the operations shall be temporarily discontinued and the RPR notified per Section 70, paragraph 70-20. At the direction of the RPR, the Contractor shall excavate the site in such a manner as to preserve the artifacts encountered and allow for their removal. Such excavation will be paid for as extra work.

Areas outside the limits of the pavement areas where the top layer of soil has become compacted by hauling or other Contractor activities shall be scarified and disked to a depth of 4 inches (100 mm), to loosen and pulverize the soil. Stones or rock fragments larger than 4 inches (100 mm) in their greatest dimension will not be permitted in the top 6 inches (150 mm) of the subgrade.

If it is necessary to interrupt existing surface drainage, sewers or under-drainage, conduits, utilities, or similar underground structures, the Contractor shall be responsible for and shall take all necessary precautions to preserve them or provide temporary services. When such facilities are encountered, the Contractor shall notify the RPR, who shall arrange for their removal if necessary. The Contractor, at their own expense, shall satisfactorily repair or pay the cost of all damage to such facilities or structures that may result from any of the Contractor's operations during the period of the contract.

a. Blasting. Blasting shall not be allowed.

152-2.2 Excavation. No excavation shall be started until the work has been staked out by the Contractor and the RPR has obtained from the Contractor, the survey notes of the elevations and measurements of the ground surface. The Contractor and RPR shall agree that the original ground lines shown on the original topographic mapping are accurate, or agree to any adjustments made to the original ground lines.

Digital terrain model (DTM) files of the existing surfaces, finished surfaces and other various surfaces were used to develop the design plans.

Volumetric quantities were calculated by comparing DTM files of the applicable design surfaces and generating Triangle Volume Reports. Electronic copies of DTM files and a paper copy of the original topographic map will be issued to the successful bidder.

Existing grades on the design cross sections or DTM's, where they do not match the locations of actual spot elevations shown on the topographic map, were developed by computer interpolation from those spot elevations. Prior to disturbing original grade, Contractor shall verify the accuracy of the existing ground surface by verifying spot elevations at the same locations where original field survey data was obtained as indicated on the topographic map. Contractor shall recognize that, due to the interpolation process, the actual ground surface at any particular location may differ somewhat from the interpolated surface shown on the design cross sections or obtained from the DTM's. Contractor's verification of original ground surface, however, shall be limited to verification of spot elevations as indicated herein, and no adjustments will be made to the original ground surface unless the Contractor demonstrates that spot elevations shown are incorrect. For this purpose, spot elevations which are within 0.1 foot (30 mm) of the stated elevations for ground surfaces, or within 0.04 foot (12 mm) for hard surfaces (pavements, buildings, foundations, structures, etc.) shall be considered "no change". Only deviations in excess of these will be considered for adjustment of the original ground surface. If Contractor's verification identifies discrepancies in the topographic map, Contractor shall notify the RPR in writing at least two weeks before disturbance of existing grade to allow sufficient time to verify the submitted information and make adjustments to the design cross sections or DTM's. Disturbance of existing grade in any area shall constitute acceptance by the Contractor of the accuracy of the original elevations shown on the topographic map for that area.

All areas to be excavated shall be stripped of vegetation and topsoil. Topsoil shall be stockpiled for future use in areas designated on the plans or by the RPR. All suitable excavated material shall be used in the formation of embankment, subgrade, or other purposes **as** shown on the plans. All unsuitable material shall be disposed of as shown on the plans.

The grade shall be maintained so that the surface is well drained at all times.

When the volume of the excavation exceeds that required to construct the embankments to the grades as indicated on the plans, the excess shall be used to grade the areas of ultimate development or disposed as directed by the RPR. When the volume of excavation is not sufficient for constructing the embankments to the grades indicated, the deficiency shall be obtained from borrow areas.

a. Selective grading. When selective grading is indicated on the plans, the more suitable material designated by the RPR shall be used in constructing the embankment or in capping the pavement subgrade. If, at the time of excavation, it is not possible to place this material in its final location, it shall be stockpiled in approved areas until it can be placed. The more suitable material shall then be placed and compacted as specified. Selective grading shall be considered incidental to the work involved. The cost of stockpiling and placing the material shall be included in the various pay items of work involved.

b. Undercutting. Rock, shale, hardpan, loose rock, boulders, or other material unsatisfactory for safety areas, subgrades, roads, shoulders, or any areas intended for turf shall be excavated to a minimum depth of 12 inches (300 mm) below the subgrade or to the depth specified by the RPR. Muck, peat, matted roots, or other yielding material, unsatisfactory for subgrade foundation, shall be removed to the depth specified. Unsuitable materials shall be disposed of at locations shown on the plans. The cost is incidental to this item. This excavated material shall be paid for at the contract unit price per cubic yard (per cubic meter) for Undercut Excavation. The excavated area shall be backfilled with suitable material obtained from the grading operations or borrow areas and compacted to specified densities. The necessary backfill will constitute a part of the embankment. Where rock cuts are made, backfill with select material.

Any pockets created in the rock surface shall be drained in accordance with the details shown on the plans. Undercutting will be paid as unclassified excavation.

c. Over-break. Over-break, including slides, is that portion of any material displaced or loosened beyond the finished work as planned or authorized by the RPR. All over-break shall be graded or removed by the Contractor and disposed of as directed by the RPR. The RPR shall determine if the displacement of such material was unavoidable and their own decision shall be final. Payment will not be made for the removal and disposal of over-break that the RPR determines as avoidable. Unavoidable over-break will be classified as "Unclassified Excavation."

d. Removal of utilities. The removal of existing structures and utilities required to permit the orderly progress of work will be accomplished by the Contractor as indicated on the plans. All existing foundations shall be excavated at least 2 feet (60 cm) below the top of subgrade or as indicated on the plans, and the material disposed of as directed by the RPR. All foundations thus excavated shall be backfilled with suitable material and compacted as specified for embankment or as shown on the plans.

152-2.3 Borrow excavation. If required, Borrow areas within the airport property are indicated on the plans. Borrow excavation shall be made only at these designated locations and within the horizontal and vertical limits as staked or as directed by the RPR. All unsuitable material shall be disposed of by the Contractor as shown on the plans. All borrow pits shall be opened to expose the various strata of acceptable material to allow obtaining a uniform product. Borrow areas shall be drained and left in a neat, presentable condition with all slopes dressed uniformly. Borrow areas shall not create a hazardous wildlife attractant.

152-2.4 Drainage excavation. Drainage excavation shall consist of excavating drainage ditches including intercepting, inlet, or outlet ditches; or other types as shown on the plans. The work shall be performed in sequence with the other construction. Ditches shall be constructed prior to starting adjacent excavation operations. All satisfactory material shall be placed in embankment fills; unsuitable material shall be placed in designated waste areas or as directed by the RPR. All necessary work shall be performed true to final line, elevation, and cross-section. The Contractor shall maintain ditches constructed on the project to the required cross-section and shall keep them free of debris or obstructions until the project is accepted.

152-2.5 Preparation of cut areas or areas where existing pavement has been removed. In those areas on which a subbase or base course is to be placed, the top 12 inches (300 mm)of subgrade shall be compacted to not less than 100 % of maximum density for non-cohesive soils, and 95% of maximum density for cohesive soils as determined by ASTM D1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

152-2.6 Preparation of embankment area. All sod and vegetative matter shall be removed from the surface upon which the embankment is to be placed. The cleared surface shall be broken up by plowing or scarifying to a minimum depth of 6 inches (150 mm) and shall then be compacted per paragraph 152-2.10.

Sloped surfaces steeper than one (1) vertical to four (4) horizontal shall be plowed, stepped, benched, or broken up so that the fill material will bond with the existing material. When the subgrade is part fill and part excavation or natural ground, the excavated or natural ground portion shall be scarified to a depth of 12 inches (300 mm) and compacted as specified for the adjacent fill.

No direct payment shall be made for the work performed under this section. The necessary clearing and grubbing and the quantity of excavation removed will be paid for under the respective items of work.

152-2.7 Control Strip. The first half-day of construction of subgrade and/or embankment shall be considered as a control strip for the Contractor to demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of this specification. The sequence and manner of rolling necessary to obtain specified density requirements shall be determined.

The maximum compacted thickness may be increased to a maximum of 12 inches (300 mm) upon the Contractor's demonstration that approved equipment and operations will uniformly compact the lift to the specified density. The RPR must witness this demonstration and approve the lift thickness prior to full production.

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

152-2.8 Formation of embankments. The material shall be constructed in lifts as established in the control strip, but not less than 6 inches nor more than 12 inches of compacted thickness.

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

The lifts shall be placed, to produce a soil structure as shown on the typical cross-section or as directed by the RPR. Materials such as brush, hedge, roots, stumps, grass and other organic matter, shall not be incorporated or buried in the embankment.

Earthwork operations shall be suspended at any time when satisfactory results cannot be obtained due to rain, freezing, or other unsatisfactory weather conditions in the field. Frozen material shall not be placed in the embankment nor shall embankment be placed upon frozen material. Material shall not be placed on surfaces that are muddy, frozen, or contain frost. The Contractor shall drag, blade, or slope the embankment to provide surface drainage at all times.

The material in each lift shall be within ±2% of optimum moisture content before rolling to obtain the prescribed compaction. The material shall be moistened or aerated as necessary to achieve a uniform moisture content throughout the lift. Natural drying may be accelerated by blending in dry material or manipulation alone to increase the rate of evaporation.

The Contractor shall make the necessary corrections and adjustments in methods, materials or moisture content to achieve the specified embankment density.

The RPR will take samples of excavated materials which will be used in embankment for testing and develop a Moisture-Density Relations of Soils Report (Proctor) in accordance with D1557. A new Proctor shall be developed for each soil type based on visual classification.

Density tests will be taken by the RPR for every 2,000 square yards of compacted embankment for each lift which is required to be compacted, or other appropriate frequencies as determined by the RPR.

If the material has greater than 30% retained on the 3/4-inch (19.0 mm) sieve, follow AASHTO T-180 Annex Correction of maximum dry density and optimum moisture for oversized particles.

Rolling operations shall be continued until the embankment is compacted to not less than 95% of maximum density for non-cohesive soils, and 90% of maximum density for cohesive soils as determined by ASTM D1557. Under all areas to be paved, the embankments shall be compacted to a depth of 12" and to a density of not less than 100% (non-cohesive soils) or 95% (cohesive soils) percent of the maximum density as determined by ASTM D1557. As used in this specification, "non-cohesive" shall mean those soils having a plasticity index (PI) of less than 3 as determined by ASTM D4318.

On all areas outside of the pavement areas, no compaction will be required on the top 4 inches (100 mm) which shall be prepared for a seedbed in accordance with Item T-901.

The in-place field density shall be determined in accordance with ASTM 6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938. The RPR shall perform all density. If the specified density is not attained, the area represented by the test or as designated by the RPR shall be reworked and/or re-compacted and additional random tests made. This procedure shall be followed until the specified density is reached.

Compaction areas shall be kept separate, and no lift shall be covered by another lift until the proper density is obtained.

During construction of the embankment, the Contractor shall route all construction equipment evenly over the entire width of the embankment as each lift is placed. Lift placement shall begin in the deepest portion of the embankment fill. As placement progresses, the lifts shall be constructed approximately parallel to the finished pavement grade line.

When rock, concrete pavement, asphalt pavement, and other embankment material are excavated at approximately the same time as the subgrade, the material shall be incorporated into the outer portion of the embankment and the subgrade material shall be incorporated under the future paved areas. Stones, fragmentary rock, and recycled pavement larger than 4 inches (100 mm) in their greatest dimensions will not be allowed in the top 12 inches (300 mm) of the subgrade. Rockfill shall be brought up in lifts as specified or as directed by the RPR and the finer material shall be used to fill the voids forming a dense, compact mass. Rock, cement concrete pavement, asphalt pavement, and other embankment material shall not be disposed of except at places and in the manner designated on the plans or by the RPR.

When the excavated material consists predominantly of rock fragments of such size that the material cannot be placed in lifts of the prescribed thickness without crushing, pulverizing or further breaking down the pieces, such material may be placed in the embankment as directed in lifts not exceeding 2 feet (60 cm) in thickness. Each lift shall be leveled and smoothed with suitable equipment by distribution of spalls and finer fragments of rock. The lift shall not be constructed above an elevation 4 feet (1.2 m) below the finished subgrade.

There will be no separate measurement of payment for compacted embankment. All costs incidental to placing in lifts, compacting, discing, watering, mixing, sloping, and other operations necessary for construction of embankments will be included in the contract price for excavation, borrow, or other items.

152-2.9 Proof rolling. The purpose of proof rolling the subgrade is to identify any weak areas in the subgrade and not for compaction of the subgrade. Before start of embankment, and after compaction is completed, the subgrade area shall be proof rolled with a 20 ton (18.1 metric ton) Tandem axle Dual Wheel Dump Truck loaded to the legal limit with tires inflated to 100 psi (0.689 MPa) in the presence of the RPR. Apply a minimum of two coverages, or as specified by the RPR, under pavement areas. A coverage is defined as the application of one tire print over the designated area. Soft areas of subgrade that deflect more than 1 inch (25 mm) or show permanent deformation greater than 1 inch (25 mm) shall be removed and replaced with suitable material or reworked to conform to the moisture content and compaction requirements in accordance with these specifications. Removal and replacement of soft areas is incidental to this item.

152-2.10 Compaction requirements. The subgrade under areas to be paved shall be compacted to a depth of 12 inches (300 mm)and to a density of not less than 100 percent of the maximum dry density as determined by ASTM D1557. The subgrade in areas outside the limits of the pavement areas shall be compacted to a depth of 12 inches and to a density of not less than 95 percent (non-cohesive soils) or 90% (cohesive soils) of the maximum density as determined by ASTM D698.

The material to be compacted shall be within ±2% of optimum moisture content before being rolled to obtain the prescribed compaction (except for expansive soils). When the material has greater than 30 percent retained on the ¾ inch (19.0 mm) sieve, follow the methods in ASTM D1557, or procedures in AASHTO T180 Annex for correction of maximum dry density and optimum moisture for oversized particles. Tests for moisture content and compaction will be taken at a minimum of one test per 2000 S.Y. of subgrade. All quality assurance testing shall be done by the RPR.

The in-place field density shall be determined in accordance with ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938 within 12 months prior to its use on this contract. The gage shall be field standardized daily.

Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

If the specified density is not attained, the entire lot shall be reworked and/or re-compacted and additional random tests made. This procedure shall be followed until the specified density is reached.

All cut-and-fill slopes shall be uniformly dressed to the slope, cross-section, and alignment shown on the plans or as directed by the RPR and the finished subgrade shall be maintained.

152-2.11 Finishing and protection of subgrade. Finishing and protection of the subgrade is incidental to this item. Grading and compacting of the subgrade shall be performed so that it will drain readily. All low areas, holes or depressions in the subgrade shall be brought to grade. Scarifying, blading, rolling and other methods shall be performed to provide a thoroughly compacted subgrade shaped to the lines and grades shown on the plans. All ruts or rough places that develop in the completed subgrade shall be graded, re-compacted, and retested. The Contractor shall protect the subgrade from damage and limit hauling over the finished subgrade to only traffic essential for construction purposes.

The Contractor shall maintain the completed course in satisfactory condition throughout placement of subsequent layers. No subbase, base, or surface course shall be placed on the subgrade until the subgrade has been accepted by the RPR.

152-2.12 Haul. All hauling will be considered a necessary and incidental part of the work. The Contractor shall include the cost in the contract unit price for the pay of items of work involved. No payment will be made separately or directly for hauling on any part of the work.

The Contractor's equipment shall not cause damage to any excavated surface, compacted lift or to the subgrade as a result of hauling operations. Any damage caused as a result of the Contractor's hauling operations shall be repaired at the Contractor's expense.

The Contractor shall be responsible for providing, maintaining and removing any haul roads or routes within or outside of the work area, and shall return the affected areas to their former condition, unless otherwise authorized in writing by the Owner. No separate payment will be made for any work or materials associated with providing, maintaining and removing haul roads or routes.

152-2.13 Surface Tolerances. In those areas on which a subbase or base course is to be placed, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches (75 mm), reshaped and re-compacted to grade until the required smoothness and accuracy are obtained and approved by the RPR. The Contractor shall perform all final smoothness and grade checks in the presence of the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense.

a. **Smoothness.** The finished surface shall not vary more than +/- ½ inch (12 mm) when tested with a 12-foot (3.7-m) straightedge applied parallel with and at right angles to the centerline. The

straightedge shall be moved continuously forward at half the length of the 12-foot (3.7-m) straightedge for the full length of each line on a 50-foot (15-m) grid.

b. Grade. The grade and crown shall be measured on a 50-foot (15-m) grid and shall be within +/- 0.05 feet (15 mm) of the specified grade.

On safety areas, turfed areas and other designated areas within the grading limits where no subbase or base is to placed, grade shall not vary more than 0.10 feet (30 mm) from specified grade. Any deviation in excess of this amount shall be corrected by loosening, adding or removing materials, and reshaping.

152-2.14 Topsoil. When topsoil is specified or required as shown on the plans or under Item T-905, it shall be salvaged from stripping or other grading operations. The topsoil shall meet the requirements of Item T-905. If, at the time of excavation or stripping, the topsoil cannot be placed in its final section of finished construction, the material shall be stockpiled at approved locations. Stockpiles shall be located as shown on the plans and the approved CSPP, and shall not be placed on areas that subsequently will require any excavation or embankment fill. If, in the judgment of the RPR, it is practical to place the salvaged topsoil at the time of excavation or stripping, the material shall be placed in its final position without stockpiling or further re-handling.

Upon completion of grading operations, stockpiled topsoil shall be handled and placed as shown on the plans and as required in Item T-905. Topsoil shall be paid for as provided in Item T-905. No direct payment will be made for topsoil under Item P-152.

METHOD OF MEASUREMENT

152-3.1 Measurement for payment specified by the cubic yard (cubic meter) shall be computed by the comparison of digital terrain model (DTM) surfaces for computation of neat line design quantities. The end area is that bound by the original ground line established by field survey and the final theoretical pay line established by contours and grades shown on the plans, subject to verification by the RPR.

152-3.2 The quantity of unclassified excavation to be paid for shall be the number of cubic yards measured in its original position. Measurement shall not include the quantity of materials excavated without authorization beyond normal slope lines, or the quantity of material used for purposes other than those directed. There shall be no measurement or payment for stockpiling material, or rehandling material from stockpile to final location.

BASIS OF PAYMENT

152-4.1 Unclassified excavation payment shall be made at the contract unit price per cubic yard. This price shall be full compensation for furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

material, compaction, furnishing all materials, labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-152-5.1	Unclassified Excavation - per cubic yard
Item P-152-5.2	Test Pits - per cubic yard

REFERENCES

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

American Association of State Highway and Transportation Officials (AASHTO)

AASHTO T-180	Standard Method of Test for Moisture-Density Relations of Soils Using a 4.54-kg (10-lb) Rammer and a 457-mm (18-in.) Drop

ASTM International (ASTM)

ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2700 kN-m/m^3))
ASTM D6938	Standard Test Methods for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)

Advisory Circulars (AC)

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

Software

FAARFIELD – FAA Rigid and Flexible Iterative Elastic Layered Design

U.S. Department of Transportation

FAA RD-76-66	Design and Construction of Airport Pavements on Expansive Soils

END OF ITEM P-152

Item P-209 Crushed Aggregate Base Course

DESCRIPTION

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

This item shall be used to patch any area of the Item P-215 Rubblized Concrete Pavement Base Course where it may be required.

MATERIALS

209-2.1 Crushed aggregate base. Crushed aggregate shall consist of clean, sound, durable particles of crushed stone, crushed gravel and shall be free from coatings of clay, silt, organic material, clay lumps or balls or other deleterious materials or coatings. The method used to produce the crushed gravel shall result in the fractured particles in the finished product as consistent and uniform as practicable. Fine aggregate portion, defined as the portion passing the No. 4 (4.75 mm) sieve shall consist of fines from the coarse aggregate crushing operation. The fine aggregate shall be produced by crushing stone, gravel, that meet the coarse aggregate requirements for wear and soundness. Aggregate base material requirements are listed in the following table.

Crushed Aggregate Base Material Requirements

Material Test	Requirement	Standard
Coarse Aggregate		
Resistance to Degradation	Loss: 45% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Percentage of Fractured Particles	Minimum 90% by weight of particles with at least two fractured faces and 98% with at least one fractured face[1]	ASTM D5821
Flat Particles, Elongated Particles, or Flat and Elongated Particles	10% maximum, by weight, of flat, elongated, or flat and elongated particles [2]	ASTM D4791
Clay lumps and friable particles	Less than or equal to 3 percent	ASTM C142
Fine Aggregate		
Liquid limit	Less than or equal to 25	ASTM D4318
Plasticity Index	Not more than five (5)	ASTM D4318

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

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

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

Gradation of Aggregate Base

Sieve Size	Design Range Percentage by Weight passing	Contractor's Final Gradation	Job Control Grading Band Tolerances[1] (Percent)
2 inch	100		0
1-1/2 inch	95-100		±5
1 inch	70-95		±8
3/4 inch	55-85		±8
No. 4	30-60		±8
No. 40[2] (425 µm)	10-30		±5
No. 200[2] (75 µm)	0-5		±3

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

[2] The fraction of material passing the No 200 (75 µm) sieve shall not exceed two-thirds the fraction passing the No 40 (425 µm) sieve.

209-2.3 Sampling and Testing.

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

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

209-2.4 Separation Geotextile. Not used

CONSTRUCTION METHODS

209-3.1 Control strip. The first half-day of construction shall be considered the control strip. The Contractor shall demonstrate, in the presence of the RPR, that the materials, equipment, and construction processes meet the requirements of the specification. The sequence and manner of rolling necessary to

obtain specified density requirements shall be determined. The maximum compacted thickness may be increased to a maximum of 12 inches (300 mm) upon the Contractor's demonstration that approved equipment and operations will uniformly compact the lift to the specified density. The RPR must witness this demonstration and approve the lift thickness prior to full production.

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

209-3.2 Preparing underlying subgrade and/or subbase. The underlying subgrade and/or subbase shall be checked and accepted by the RPR before base course placing and spreading operations begin. Re-proof rolling of the subgrade or proof rolling of the subbase in accordance with Item P-152, at the Contractor's expense, may be required by the RPR if the Contractor fails to ensure proper drainage or protect the subgrade and/or subbase. Any ruts or soft, yielding areas due to improper drainage conditions, hauling, or any other cause, shall be corrected before the base course is placed. To ensure proper drainage, the spreading of the base shall begin along the centerline of the pavement on a crowned section or on the high side of the pavement with a one-way slope.

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

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

The aggregate shall meet gradation and moisture requirements prior to compaction. The base course shall be constructed in lifts as established in the control strip, but not less than 4 inches (100 mm) nor more than 12 inches (300 mm) of compacted thickness.

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

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

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

209-3.6 Weather limitations. Material shall not be placed unless the ambient air temperature is at least 40°F (4°C) and rising. Work on base course shall not be conducted when the subgrade or subbase is wet or frozen or the base material contains frozen material.

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

209-3.8 Surface tolerances. After the course has been compacted, the surface shall be tested for smoothness and accuracy of grade and crown. Any portion lacking the required smoothness or failing in accuracy of grade or crown shall be scarified to a depth of at least 3 inches (75 mm), reshaped and recompacted to grade until the required smoothness and accuracy are obtained and approved by the RPR. Any deviation in surface tolerances shall be corrected by the Contractor at the Contractor's expense. The smoothness and accuracy requirements specified here apply only to the top layer when base course is constructed in more than one layer.

a. Smoothness. The finished surface shall not vary more than 3/8-inch (9 mm) when tested with a 12-foot (3.7-m) straightedge applied parallel with and at right angles to the centerline. The straightedge shall be moved continuously forward at half the length of the 12-foot (3.7-m) straightedge for the full length of each line on a 50-foot (15-m) grid.

b. Grade. The grade and crown shall be measured on a 50-foot (15-m) grid and shall be within +0 and -1/2 inch (12 mm) of the specified grade. The contractor shall survey the final surface on a minimum 25' x 25' grid. Survey shall be completed by a licensed surveyor and shall be submitted to the RPR and reviewed prior to placement of subsequent layers.

209-3.9 Acceptance sampling and testing. Crushed aggregate base course shall be accepted for density and thickness on an area basis. Two tests shall be made for density and thickness for each 1200 square yds (1000 m^2). Sampling locations will be determined on a random basis per ASTM D3665

a. Density. The RPR shall perform all density tests**.**

Each area shall be accepted for density when the field density is at least 100% of the maximum density of laboratory specimens compacted and tested per ASTM D1557. The in-place field density shall be determined per ASTM D6938 using Procedure A, the direct transmission method, and ASTM D6938 shall be used to determine the moisture content of the material. The machine shall be calibrated in accordance with ASTM D6938. If the specified density is not attained, the area represented by the failed test must be reworked and/or recompacted and two additional random tests made. This procedure shall be followed until the specified density is reached. Maximum density refers to maximum dry density at optimum moisture content unless otherwise specified.

b. Thickness. Thickness shall be verified by topographic survey completed by the contractor. The thickness of the base course shall be within +0 and -1/2 inch (12 mm) of the specified thickness as determined by topographic survey in the presence of the RPR for each area. Where the thickness is deficient by more than 1/2-inch (12 mm), the Contractor shall correct such areas at no additional cost by scarifying to a depth of at least 3 inches (75 mm), adding new material of proper gradation, and the material shall be blended and recompacted to grade. The Contractor shall replace, at his expense, base material where depth tests have been taken.

METHOD OF MEASUREMENT

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

BASIS OF PAYMENT

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

Payment will be made under:

Item P-209-5.1	Crushed Aggregate Base Course - per cubic yard

REFERENCES

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

ASTM International (ASTM)

ASTM C29	Standard Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft^3 (600 kN-m/m^3))
ASTM D1556	Standard Test Method for Density and Unit Weight of Soil in Place by the Sand-Cone Method
ASTM D1557	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2700 kN-m/m^3))
ASTM D2167	Standard Test Method for Density and Unit Weight of Soil in Place by the Rubber Balloon Method
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate

ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D4643	Standard Test Method for Determination of Water Content of Soil and Rock by Microwave Oven Heating
ASTM D4751	Standard Test Methods for Determining Apparent Opening Size of a Geotextile
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
ASTM D6938	Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
ASTM D7928	Standard Test Method for Particle-Size Distribution (Gradation) of Fine-Grained Soils Using the Sedimentation (Hydrometer) Analysis

American Association of State Highway and Transportation Officials (AASHTO)

M288	Standard Specification for Geosynthetic Specification for Highway Applications

END OF ITEM P-209

Item P-215 Rubblized Portland Cement Concrete Pavements

DESCRIPTION

215-1.1 General Description. This work consists of a rubblized concrete pavement base course resulting from the in place rubblization and compaction of an existing cement concrete pavement. The work must be accomplished according to the standard specifications and details shown in the plans.

MATERIALS

215-2.1 Asphalt Mix Pavement.

Asphalt Mix for patching is as described in Item P-401.

215-2.2 Crushed Aggregate Base.

Crushed aggregate base course for patching is as described in Item P-209.

215-2.3 Unclassified Excavation.

Unclassified excavation for patching is the volume of materials removed according to Item P-152. The volume of material is determined according to Item P-152.

CONSTRUCTION METHODS

215-3.1 Control Strip.

215-3.1-1 Test Section.

Before the rubblization operations begin, the RPR designates a test section of approximately 150 feet by 12 feet. The Contractor must demonstrate the equipment and process to be used to break, rubblize, seat, compact, and finish the rubblization of the concrete slab, eliminating all slab action.

215-3.1-2 Test Pit.

Excavate a 4-foot (1.2-meter) square test pit in the middle of the test strip, at a location the RPR selected, to determine that the breaker is producing particles that meet the specifications. Check the rubblized particle sizes throughout the entire depth of the pavement. Fill the test pit with coarse aggregate or other material, as approved by the RPR. Place and properly compact the replacement material.

The RPR may require additional test pits to confirm that adjustments to the process produce material that conforms with the requirements of the specification.

215-3.1-3 Adjustments to Rubblization Process.

It may be necessary make adjustments to the rubblization process such as: striking pattern striking height (energy) and equipment used to seat the rubbilized material to establish a rubblization procedure that meets the requirements of this specification (75% of particles less than 3 inches (76 mm) on the surface and no particles larger than 1.25 times the slab thickness in the bottom half.)

215-3.1-4 Project Rubblization Procedure.

Prior to proceeding with rubblization, the RPR must approve the rubblization procedure to be used. Continuously monitor the rubblization operation, and make minor adjustments in the striking pattern, striking energy, number of passes, and other factors necessary to continually achieve acceptable breaking throughout the project.

215-3.2 Rubblization and Seating Equipment.

Accomplish rubblization by using a pavement breaker machine capable of delivering sufficient energy to rubblize the pavement full depth in a manner that eliminates all slab action. Seating equipment must be used to settle and seat the rubblized concrete and to provide a smooth surface for the wearing surface. The type of rubblization machine and the types of associated rolling equipment used in the rubblization process must be either the resonant breaker process or the multi-head breaker process. The Contractor may pre-fracture with a guillotine breaking device.

Rubblization machines and rollers of other design that accomplishes similar results may be used with the RPR's approval. All rubblization and seating equipment necessary to perform the work is considered essential to the completion of the project and is not paid for separately.

215-3.3 Multi-Head Breaker Process.

215-3.3-1 Pre Breaker Machine. This is a rubber-tired, self-propelled, guillotine-style concrete pavement breaker for the purpose of pre-breaking concrete pavement. The machine shall have a eight-foot wide, 12,000 pound hammer with an adjustable drop height from 0 to 9 feet.

215-3.3-2 Multi-Head Breaker Machine. This is a self-contained, self-propelled, multi-head breaker specifically designed for the purpose of rubblizing PCC pavement. The machine must be able to rubblize the pavement a minimum width of 8 feet per pass. Pavement- breaking hammers must be mounted laterally in pairs, with half the hammers in a forward row and the remainder diagonally offset in a rear row so there is continuous breakage from side to side. The lift height of the hammers must be independently adjustable.

215-3.3-3 Multi-Head Breaker Seating Equipment.

215-3.3-4 The contractor shall provide and use the following seating equipment:

215-3.3-5 Z-Grid Roller. This is a vibratory steel drum roller fitted with a "Z" pattern grid on the drum face. The roller shall have a gross weight of at least 10 tons, as operated in the vibratory mode, to settle and seat the rubblized pavement, and provide a smooth surface for the bituminous concrete overlay.

215-3.3-6 Pneumatic-Tire Roller. A pneumatic-tire roller with a gross weight of at least 25 tons must be used after the Z-grid roller to further settle and seat the rubblized pavement.

215-3.3-7 Smooth Steel Drum Vibratory Roller. Provide and use a smooth steel drum vibratory roller. The roller must have a gross weight of at least 10 tons (9.1 metric tons) as operated in the vibratory mode, to settle and seat the rubblized pavement and provide a smooth surface for the bituminous concrete overlay.

215-3.4 Construction Requirements.

215-3.4-1 Drainage System Installation. Prior to rubblization operations, install drainage systems as specified on the plans. Drainage systems must properly function for a minimum of two weeks prior to rubblization.

215-3.4-2 Removal of Existing Asphalt Surfaces. Prior to the rubblization operations, remove existing asphalt overlays and patches from the PCC pavement surfaces to be rubblized. Existing full-depth asphalt patches may remain in place unless the plans indicate removal.

215-3.4-3 Eliminate Load Transfer to Remaining PCC Pavement. Make a full-depth saw-cut along an existing joint where rubblized PCC abuts pavement to remain in place, to eliminate all load transfer between the planned rubblization and PCC pavement remaining in place.

215-3.5 Rubblization Criteria.

215-3.5-1 Rubblize the concrete pavement into particles with at least 75% smaller 7832 than: 3 inches (75 mm) at surface, based on visual observation, and no particles larger than 1.25 times the slab thickness.

215-3.5-2 For reinforced concrete pavement, reinforcing steel must be substantially de-bonded from the concrete. Steel may be left in place, unless it protrudes above the surface. Reduce concrete pieces below the reinforcing steel to the greatest possible extent, individual pieces below reinforcing must not exceed 1.25 times the slab thickness. 215-3.7 General Rubblization Procedures.

215-3.6 Rubblization Procedures

215-3.6-1 Rubblize in partial widths when necessary to maintain traffic, as shown on the plans, and contained in the contract documents. When the rubblization process is adjacent to active pavement, take measures to prevent debris from entering the active pavement. In areas where the pavement is to be overlayed prior to completion of the rubblization, extend the initial rubblization a minimum of 2 feet (600 mm) beyond the width of the pavement to be overlayed.

215-3.6-2 For the resonant breaker process, begin rubblizing at a free edge or previously broken edge and progress toward the opposite shoulder or longitudinal centerline of the pavement until the entire concrete pavement surface has been rubbilized. Additional passes of the resonant breaker machine are required if larger concrete pieces remain above the reinforcement.

215-3.6-3 Dust Control

The Contractor must control the dust from the rubblization operation until the rubblized surface is overlayed with bituminous concrete.

215-3.6-4 Damage to Base and Underlying Infrastructure.

Operate the rubblization machine and rollers in a manner that avoids damaging the base, underlying structures, utilities, drainage facilities, bridge approach slabs, bridge decks, and other facilities on the project. If any damage occurs, the Contractor must immediately cease operations, notify the RPR, and repair the damage at the RPR's direction. The Contractor must make timely repairs at their expense**.**

215-3.6-5 Removal of Exposed Reinforcing Steel.

Cut reinforcing steel that is exposed flush or slightly below the rubblized surface and remove from the project.

215-3.6-5 Removal of Joint Filler and Other Loose Items.

Removal of Joint Filler and Other Loose Items. Remove any loose joint filler, expansion materials, or other similar items.

215-3.6-6 Seating.

Seating of rubblized concrete as specified in paragraph 215-3.7.

215-3.6-7 Proof Rolling

At the direction of the RPR proof roll any areas that appear unstable.

215-3.6-8 Patching Unstable Areas. Patch unstable areas and/or areas of poor subgrade support as identified during the rubblization and seating process at the direction of the RPR. Typically, the rubblized pavement, base course, and subgrade material are removed from unstable areas. Replace the material with aggregate base course or hot mix asphalt as directed by the RPR. Patching procedures must conform to the standard specifications and be completed prior to placing the final surface.

215-3.6-9 Leveling Course.

Add a P-209 or P-401 leveling course to correct rough or uneven surface as directed by the RPR.

215-3.6-10 Finishing.

Finish the surface of the base course by blading or other approved equipment designed for this purpose. If the elevation of the top layer is ½ inch (12 mm) or more below grade, scarify the top layer of base to a depth of at least 3 inches (75 mm), new material added, and the layer blended and recompacted to bring it to grade, at the Contractor's expense. If the finished surface is above plan grade, cut it to grade and reroll. A milling machine may be used to trim the surface to grade.

215-3.6-10 Construction Traffic.

Minimize construction traffic on the rubblized material while waiting for the final surface to be placed.

215-3.7 Seating Procedures.

The Contractor must use the rolling equipment contained in these specifications. Roll the surface until the rubblized material is compact and the surface is smooth. Additional rolling at the direction of the RPR is considered incidental to the work and is not paid for separately. Do not perform rolling in wet conditions.

1. Prior to placing the next pavement layer, roll the entire width of the pavement by vibratory and pneumatic-tire rollers following the sequence contained herein. For this operation, a pass is defined as forward and back over the entire surface area.
2. After rubblizing, a minimum of two passes with the Z-grid roller must follow the multi-head breaker machine, followed by a minimum of one pass with the pneumatic-tire roller.
3. Immediately prior to placement of next pavement layer, roll a minimum of one pass with the vibratory steel drum roller

215-3.9 Progress of the Work.

If rain occurs prior to paving, sufficient time must be allowed for the rubblized pavement to dry and become stable. Paving over the rubblized base course must not begin until approved by the RPR.

215-4 METHOD OF MEASUREMENT

215-4.1 Measurement of Rubblization.

Rubbilized Concrete pavement is measured by the square yards completed and accepted in accordance with the plans and specifications.

BASIS OF PAYMENT

215-5.1 Concrete Pavement Rubblization. This item shall include full compensation for rubblizing the existing PCC pavement, rolling the pavement, and for all equipment, tools, labor, and incidentals necessary to complete the work. In addition, this item shall include full compensation for all labor, equipment, tools, and incidentals necessary to furnish and apply water for dust control, provide test sections and test pits, saw-cut concrete, cut and remove exposed concrete reinforcing material, remove joint filler and other debris, cleanup, waste removal and disposal, and preparation of the rubblized surface prior to the bituminous concrete overlay and to complete the work as specified.

Patching Materials will be paid for under P-209 and P-401items respectively.

Payment will be made under:

Item P215-5.1	Concrete Pavement Rubblization - per square yard

END OF ITEM P-215

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Item P-401 Asphalt Mix Pavement

DESCRIPTION

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

MATERIALS

401-2.1 Aggregate. Aggregates shall consist of crushed stone, crushed gravel, crushed slag, screenings, natural sand, and mineral filler, as required. The aggregates should have no known history of detrimental pavement staining due to ferrous sulfides, such as pyrite. Coarse aggregate is the material retained on the No. 4 (4.75 mm) sieve. Fine aggregate is the material passing the No. 4 (4.75 mm) sieve.

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

Coarse Aggregate Material Requirements

Material Test	Requirement	Standard
Resistance to Degradation	Loss: 40% maximum	ASTM C131
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 12% maximum using Sodium sulfate - or - 18% maximum using magnesium sulfate	ASTM C88
Clay lumps and friable particles	1.0 % maximum	ASTM C142
Percentage of Fractured Particles	For pavements designed for aircraft gross weights of 60,000 pounds (27200 kg) or more: Minimum 75% by weight of particles with at least two fractured faces and 85% with at least one fractured face[1]	ASTM D5821
	~~For pavements designed for aircraft gross weights less than 60,000 pounds (27200 kg):~~ ~~Minimum 50% by weight of particles with at least two fractured faces and 65% with at least one fractured face[1]~~	
Flat, Elongated, or Flat and Elongated Particles	8% maximum, by weight, of flat, elongated, or flat and elongated particles at 5:1 [2]	ASTM D4791
Bulk density of slag [3]	Weigh not less than 70 pounds per cubic foot (1.12 Mg/cubic meter)	ASTM C29.

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

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

[3] Only required if slag is specified.

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

Fine Aggregate Material Requirements

Material Test	Requirement	Standard
Liquid limit	25 maximum	ASTM D4318
Plasticity Index	4 maximum	ASTM D4318
Soundness of Aggregates by Use of Sodium Sulfate **or** Magnesium Sulfate	Loss after 5 cycles: 10% maximum using Sodium sulfate - or - 15% maximum using magnesium sulfate	ASTM C88
Clay lumps and friable particles	1.0 % maximum	ASTM C142
Sand equivalent	45 minimum	ASTM D2419
Natural Sand	0% to 15% maximum by weight of total aggregate	ASTM D1073

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

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

Mineral Filler Requirements

Material Test	Requirement	Standard
Plasticity Index	4 maximum	ASTM D4318

401-2.3 Asphalt binder. Asphalt binder shall conform to ASTM D6373 Performance Grade (PG) 70-22 and PG 76-22 in locations as noted on the drawings.

Asphalt Binder PG Plus Test Requirements

Material Test	Requirement	Standard
Elastic Recovery	[75%] minimum	ASTM D6084[1]

[1] Follow procedure B on RTFO aged binder.

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

COMPOSITION

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

401-3.2 Job mix formula (JMF) laboratory. The laboratory used to develop the JMF shall possess a current certificate of accreditation, listing D3666 from a national accrediting authority and all test methods required for developing the JMF; and be listed on the accrediting authority's website. A copy of the laboratory's current accreditation and accredited test methods shall be submitted to the Resident Project Representative (RPR) prior to start of construction.

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

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

The JMF shall be prepared by an accredited laboratory that meets the requirements of paragraph 401-3.2. The asphalt mixture shall be designed using procedures contained in Asphalt Institute MS-2 Mix Design Manual, 7th Edition**.** Samples shall be prepared and compacted using the gyratory compactor in accordance with ASTM D6925.

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

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

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

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

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

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

Table 1. Asphalt Design Criteria

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

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

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

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

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

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

Table 2. Aggregate - Asphalt Pavements

Sieve Size	Percentage by Weight Passing Sieve Base & Surface Courses	Percentage by Weight Passing Sieve Leveling Course
1 inch (25.0 mm)	--	
3/4 inch (19.0 mm)	100	
1/2 inch (12.5 mm)	90-100	100
3/8 inch (9.5 mm)	72-88	90-100
No. 4 (4.75 mm)	53-73	58-78
No. 8 (2.36 mm)	38-60	40-60
No. 16 (1.18 mm)	26-48	28-48
No. 30 (600 µm)	18-38	18-38
No. 50 (300 µm)	11-27	11-27
No. 100 (150 µm)	6-18	6-18
No. 200 (75 µm)	3-6	3-6
Minimum Voids in Mineral Aggregate (VMA)[1]	15.0	16.0
Asphalt Percent:		
Stone or gravel	5.0-7.5	5.5-8.0
Slag	6.5-9.5	7.0-10.5
Recommended Minimum Construction Lift Thickness	2”	1.5”

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

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

401-3.4 Reclaimed asphalt pavement (RAP). RAP shall not be used.

401-3.5 Control Strip. Full production shall not begin until an acceptable control strip has been constructed and accepted in writing by the RPR**.** The Contractor shall prepare and place a quantity of asphalt according to the JMF. The underlying grade or pavement structure upon which the control strip is to be constructed shall be the same as the remainder of the course represented by the control strip.

The Contractor will not be allowed to place the control strip until the Contractor quality control program (CQCP), showing conformance with the requirements of paragraph 401-5.1, has been accepted, in writing, by the RPR.

The control strip will consist of at least 250 tons (227 metric tons) or 1/2 sublot, whichever is greater. The control strip shall be placed in two lanes of the same width and depth to be used in production with a longitudinal cold joint. The cold joint must be cut back in accordance with paragraph 401-4.14 using the same procedure that will be used during production. The cold joint for the control strip will be an exposed construction joint at least four (4) hours old or when the mat has cooled to less than 160°F (71°C). The

equipment used in construction of the control strip shall be the same type, configuration and weight to be used on the project.

The control strip will be considered acceptable by the RPR if the gradation, asphalt content, and VMA are within the action limits specified in paragraph 401-5.5a; and Mat density greater than or equal to 94.5%, air voids 3.5% +/- 1%, and joint density greater than or equal to 92.5%.

If the control strip is unacceptable, necessary adjustments to the JMF, plant operation, placing procedures, and/or rolling procedures shall be made and another control strip shall be placed. Unacceptable control strips shall be removed at the Contractor's expense.

The control strip will be considered one lot for payment based upon the average of a minimum of 3 samples (no sublots required for control strip). Payment will only be made for an acceptable control strip in accordance with paragraph 401-8.1 using a lot pay factor equal to 100.

CONSTRUCTION METHODS

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

Table 4. Surface Temperature Limitations of Underlying Course

Mat Thickness	Base Temperature (Minimum)	
	°F	°C
3 inches (7.5 cm) or greater	40 [1]	4
Greater than 2 inches (50 mm) but less than 3 inches (7.5 cm)	45	7

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

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

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

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

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

401-4.4 Hauling equipment. Trucks used for hauling asphalt shall have tight, clean, and smooth metal beds. To prevent the asphalt from sticking to the truck beds, the truck beds shall be lightly coated with a

minimum amount of paraffin oil, lime solution, or other material approved by the RPR. Petroleum products shall not be used for coating truck beds. Each truck shall have a suitable cover to protect the mixture from adverse weather. When necessary, to ensure that the mixture will be delivered to the site at the specified temperature, truck beds shall be insulated or heated and covers shall be securely fastened.

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

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

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

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

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

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

401-4.8 Preparation of asphalt binder. The asphalt binder shall be heated in a manner that will avoid local overheating and provide a continuous supply of the asphalt binder to the mixer at a uniform temperature. The temperature of unmodified asphalt binder delivered to the mixer shall be sufficient to provide a suitable viscosity for adequate coating of the aggregate particles, but shall not exceed 325°F (160°C) when added to the aggregate. The temperature of modified asphalt binder shall be no more than 350°F (175°C) when added to the aggregate.

401-4.9 Preparation of mineral aggregate. The aggregate for the asphalt shall be heated and dried. The maximum temperature and rate of heating shall be such that no damage occurs to the aggregates. The temperature of the aggregate and mineral filler shall not exceed 350°F (175°C) when the asphalt binder is added. Particular care shall be taken that aggregates high in calcium or magnesium content are not damaged by overheating. The temperature shall not be lower than is required to obtain complete coating and uniform distribution on the aggregate particles and to provide a mixture of satisfactory workability.

401-4.10 Preparation of Asphalt mixture. The aggregates and the asphalt binder shall be weighed or metered and mixed in the amount specified by the JMF. The combined materials shall be mixed until the aggregate obtains a uniform coating of asphalt binder and is thoroughly distributed throughout the

mixture. Wet mixing time shall be the shortest time that will produce a satisfactory mixture, but not less than 25 seconds for batch plants. The wet mixing time for all plants shall be established by the Contractor, based on the procedure for determining the percentage of coated particles described in ASTM D2489, for each individual plant and for each type of aggregate used. The wet mixing time will be set to achieve 95% of coated particles. For continuous mix plants, the minimum mixing time shall be determined by dividing the weight of its contents at operating level by the weight of the mixture delivered per second by the mixer. The moisture content of all asphalt upon discharge shall not exceed 0.5%.

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

A tack coat shall be applied in accordance with Item P-603 to all vertical and horizontal asphalt and concrete surfaces prior to placement of the first and each subsequent lift of asphalt mixture.

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

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

Contractor shall survey each lift of asphalt surface course and certify to RPR that every lot of each lift meets the grade tolerances of paragraph 401-6.2d before the next lift can be placed.

Edges of existing asphalt pavement abutting the new work shall be saw cut and the cut off material and laitance removed. Apply a tack coat in accordance with P-603 before new asphalt material is placed against it.

The speed of the paver shall be regulated to eliminate pulling and tearing of the asphalt mat. Placement of the asphalt mix shall begin along the centerline of a crowned section or on the high side of areas with a one way slope unless shown otherwise on the laydown plan as accepted by the RPR. The asphalt mix shall be placed in consecutive adjacent lanes having a minimum width of 12.5’feet except where edge lanes require less width to complete the area. Additional screed sections attached to widen the paver to meet the minimum lane width requirements must include additional auger sections to move the asphalt mixture uniformly along the screed extension.

The longitudinal joint in one course shall offset the longitudinal joint in the course immediately below by at least one foot (30 cm); however, the joint in the surface top course shall be at the centerline of crowned pavements. Transverse joints in one course shall be offset by at least 10 feet (3 m) from transverse joints in the previous course. Transverse joints in adjacent lanes shall be offset a minimum of 10 feet (3 m). In areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the asphalt may be spread and luted by hand tools.

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

Areas of segregation in the surface course, as determined by the RPR, shall be removed and replaced at the Contractor's expense. The area shall be removed by saw cutting and milling a minimum of the construction lift thickness as specified in paragraph 401-3.3, Table 2 for the approved mix design. The area to be removed and replaced shall be a minimum width of the paver and a minimum of 10 feet (3 m) long.

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

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

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

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

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

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

Longitudinal joints which have been left exposed for more than four (4) hours; the surface temperature has cooled to less than 175°F (80°C); or are irregular, damaged, uncompacted or otherwise defective shall be cut back with a cutting wheel or pavement saw a maximum of 3 inches (75 mm) to expose a clean, sound, uniform vertical surface for the full depth of the course. All cutback material and any laitance produced from cutting joints shall be removed from the project and shall not be paid for. Asphalt tack coat in accordance with P-603 shall be applied to the clean, dry joint prior to placing any additional fresh asphalt against the joint. The cost of this work shall be considered incidental to the cost of the asphalt.

401-4.15 Saw-cut grooving. Saw-cut grooving is not required.

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

Diamond grinding shall be performed with a machine designed specifically for diamond grinding capable of cutting a path at least 3 feet (0.9 m) wide. The saw blades shall be 1/8-inch (3-mm) wide with a sufficient number of blades to create grooves between 0.090 and 0.130 inches (2 and 3.5 mm) wide; and peaks and ridges approximately 1/32 inch (1 mm) higher than the bottom of the grinding cut. The actual number of blades will be determined by the Contractor and depend on the hardness of the aggregate.

Equipment or grinding procedures that cause ravels, aggregate fractures, spalls or disturbance to the pavement will not be permitted. Contractor shall demonstrate to the RPR that the grinding equipment will produce satisfactory results prior to making corrections to surfaces.Grinding will be tapered in all directions to provide smooth transitions to areas not requiring grinding. The slurry resulting from the grinding operation shall be continuously removed and the pavement left in a clean condition. The Contractor shall apply a surface treatment per P-608 to all areas that have been subject to grinding.

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

CONTRACTOR QUALITY CONTROL (CQC)

401-5.1 General. The Contractor shall develop a Contractor Quality Control Program (CQCP) in accordance with Item C-100. No partial payment will be made for materials without an approved CQCP.

401-5.2 Contractor quality control (QC) facilities. The Contractor shall provide or contract for testing facilities in accordance with Item C-100. The RPR shall be permitted unrestricted access to inspect the Contractor's QC facilities and witness QC activities. The RPR will advise the Contractor in writing of any noted deficiencies concerning the QC facility, equipment, supplies, or testing personnel and procedures. When the deficiencies are serious enough to be adversely affecting the test results, the incorporation of the materials into the work shall be suspended immediately and will not be permitted to resume until the deficiencies are satisfactorily corrected.

401-5.3 Contractor QC testing. The Contractor shall perform all QC tests necessary to control the production and construction processes applicable to these specifications and as set forth in the approved CQCP. The testing program shall include, but not necessarily be limited to, tests for the control of asphalt content, aggregate gradation, temperatures, aggregate moisture, field compaction, and surface smoothness. A QC Testing Plan shall be developed as part of the CQCP.

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

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

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

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

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

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

g. Smoothness for Contractor Quality Control.

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

The Contractor may use a 12-foot (3.7m) straightedge, a rolling inclinometer meeting the requirements of ASTM E2133 or rolling external reference device that can simulate a 12-foot (3.7m) straightedge approved by the RPR. Straight-edge testing shall start with one-half the length of the straightedge at the edge of pavement section being tested and then moved ahead one-half the length of the straightedge for each successive measurement. Testing shall be continuous across all joints. The surface irregularity shall be determined by placing the freestanding (unleveled) straightedge on the pavement surface and allowing it to rest upon the two highest spots covered by its length, and measuring the maximum gap between the straightedge and the pavement surface in the area between the two high points. If the rolling inclinometer or external reference device is used, the data may be evaluated using the FAA profile program, ProFAA, or FHWA ProVal, using the 12-foot straightedge simulation function.

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

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

(2) Longitudinal measurements. Longitudinal measurements shall be taken for each day's production placed. Longitudinal tests shall be parallel to the centerline of paving; at the center of paving lanes when widths of paving lanes are less than 20 feet (6 m); and at the third points of paving lanes when widths of paving lanes are 20 ft (6 m) or greater. When placement abuts previously placed material the first measurement shall start with one half the length of the straight edge on the previously placed material.

Deviations on the final surface course in either the transverse or longitudinal direction that will trap water greater than 1/4 inch (6 mm) shall be corrected with diamond grinding per paragraph 401-4.16 or by removing and replacing the surface course to full depth. Grinding shall be tapered in all directions to provide smooth transitions to areas not requiring grinding. All areas in which diamond grinding has been performed shall be subject to the final pavement thickness tolerances specified in paragraph 401-6.1d(3). Areas that have been ground shall be sealed with a surface treatment in accordance with Item P-608. To avoid the surface treatment creating any conflict with runway or taxiway markings, it may be necessary to seal a larger area.

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

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

Measurements will be taken at appropriate gradelines (as a minimum at center and edges of paving lane) and longitudinal spacing as shown on cross-sections and plans. The final surface of the pavement will not vary from the gradeline elevations and cross-sections shown on the plans by more than 1/2 inch

(12 mm) vertically and 0.1 feet (30 mm) laterally. The documentation will be provided by the Contractor to the RPR within 24 hours.

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

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

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

401-5.5 Control charts. The Contractor shall maintain linear control charts for both individual measurements and range (i.e. difference between highest and lowest measurements) for aggregate gradation, asphalt content, and VMA. The VMA for each day will be calculated and monitored by the QC laboratory.

Control charts shall be posted in a location satisfactory to the RPR and kept current. As a minimum, the control charts shall identify the project number, the contract item number, the test number, each test parameter, the Action and Suspension Limits applicable to each test parameter, and the Contractor's test results. The Contractor shall use the control charts as part of a process control system for identifying potential problems and assignable causes before they occur. If the Contractor's projected data during production indicates a problem and the Contractor is not taking satisfactory corrective action, the RPR may suspend production or acceptance of the material.

a. Individual measurements. Control charts for individual measurements shall be established to maintain process control within tolerance for aggregate gradation, asphalt content, and VMA. The control charts shall use the job mix formula target values as indicators of central tendency for the following test *parameters with associated Action and Suspension Limits:*

Control Chart Limits for Individual Measurements

Sieve	Action Limit	Suspension Limit
3/4 inch (19.0 mm)	±6%	±9%
1/2 inch (12.5 mm)	±6%	±9%
3/8 inch (9.5 mm)	±6%	±9%
No. 4 (4.75 mm)	±6%	±9%
No. 16 (1.18 mm)	±5%	±7.5%
No. 50 (300 µm)	±3%	±4.5%
No. 200 (75 µm)	±2%	±3%
Asphalt Content	±0.45%	±0.70%
Minimum VMA	-0.5%	-1.0%

b. Range. Control charts shall be established to control gradation process variability. The range shall be plotted as the difference between the two test results for each control parameter. The Suspension Limits specified below are based on a sample size of n = 2. Should the Contractor elect to perform more than two tests per lot, the Suspension Limits shall be adjusted by multiplying the Suspension Limit by 1.18 for n = 3 and by 1.27 for n = 4.

Control Chart Limits Based on Range

Sieve	Suspension Limit
1/2 inch (12.5 mm)	11%
3/8 inch (9.5 mm)	11%
No. 4 (4.75 mm)	11%
No. 16 (1.18 mm)	9%
No. 50 (300 µm)	6%
No. 200 (75 µm)	3.5%
Asphalt Content	0.8%

c. Corrective Action. The CQCP shall indicate that appropriate action shall be taken when the process is believed to be out of tolerance. The Plan shall contain rules to gauge when a process is out of control and detail what action will be taken to bring the process into control. As a minimum, a process shall be deemed out of control and production stopped and corrective action taken, if:

(1) One point falls outside the Suspension Limit line for individual measurements or range; or

(2) Two points in a row fall outside the Action Limit line for individual measurements.

401-5.6 QC reports. The Contractor shall maintain records and shall submit reports of QC activities daily, in accordance with Item C-100.

MATERIAL ACCEPTANCE

401-6.1 Acceptance sampling and testing. Unless otherwise specified, all acceptance sampling and testing necessary to determine conformance with the requirements specified in this section will be performed by the RPR at no cost to the Contractor except that coring as required in this section shall be completed and paid for by the Contractor.

a. Quality assurance (QA) testing laboratory. The QA testing laboratory performing these acceptance tests will be accredited in accordance with ASTM D3666. The QA laboratory accreditation will be current and listed on the accrediting authority's website. All test methods required for acceptance sampling and testing will be listed on the lab accreditation.

b. Lot size. A standard lot will be equal to one day's production divided into approximately equal sublots of between 400 to 600 tons. When only one or two sublots are produced in a day's production, the sublots will be combined with the production lot from the previous or next day.

Where more than one plant is simultaneously producing asphalt for the job, the lot sizes will apply separately for each plant.

c. Asphalt air voids. Plant-produced asphalt will be tested for air voids on a sublot basis.

(1) Sampling. Material from each sublot shall be sampled in accordance with ASTM D3665. Samples shall be taken from material deposited into trucks at the plant or at the job site in accordance with ASTM D979. The sample of asphalt may be put in a covered metal tin and placed in an oven for not less than 30 minutes nor more than 60 minutes to maintain the material at or above the compaction temperature as specified in the JMF.

(2) Testing. Air voids will be determined for each sublot in accordance with ASTM D3203 for a set of three compacted specimens prepared in accordance with ASTM D6925.

d. In-place asphalt mat and joint density. Each sublot will be tested for in-place mat and joint density as a percentage of the theoretical maximum density (TMD).

(1) Sampling. The Contractor will cut minimum 5 inch (125 mm) diameter samples in accordance with ASTM D5361. The Contractor shall furnish all tools, labor, and materials for cleaning, and filling the cored pavement. Laitance produced by the coring peration shall be removed immediately after coring, and core holes shall be filled within one day after sampling in a manner acceptable to the RPR.

(2) Bond. Each lift of asphalt shall be bonded to the underlying layer. If cores reveal that the surface is not bonded, additional cores shall be taken as directed by the RPR to determine the extent of unbonded areas. Unbonded areas shall be removed by milling and replaced at no additional cost as directed by the RPR.

(3) Thickness. Thickness of each lift of surface course will be evaluated by the RPR for compliance to the requirements shown on the plans after any necessary corrections for grade. Measurements of thickness will be made using the cores extracted for each sublot for density measurement. The maximum allowable deficiency at any point will not be more than 1/4 inch (6 mm) less than the thickness indicated for the lift. Average thickness of lift, or combined lifts, will not be less than the indicated thickness. Where the thickness tolerances are not met, the lot or sublot shall be corrected by the Contractor at his expense by removing the deficient area and replacing with new pavement. The Contractor, at his expense, may take additional cores as approved by the RPR to circumscribe the deficient area.

(4) Mat density. One core shall be taken from each sublot. Core locations will be determined by the RPR in accordance with ASTM D3665. Cores for mat density shall not be taken closer than one foot (30 cm) from a transverse or longitudinal joint. The bulk specific gravity of each cored sample will be determined in accordance with ASTM D2726. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each sublot sample by the TMD for that sublot.

(5) Joint density. One core centered over the longitudinal joint shall be taken for each sublot that has a longitudinal joint. Core locations will be determined by the RPR in accordance with ASTM D3665. The bulk specific gravity of each core sample will be determined in accordance with ASTM D2726. The percent compaction (density) of each sample will be determined by dividing the bulk specific gravity of each joint density sample by the average TMD for the lot. The TMD used to determine the joint density at joints formed between lots will be the lower of the average TMD values from the adjacent lots.

401-6.2 Acceptance criteria.

a. General. Acceptance will be based on the implementation of the Contractor Quality Control Program (CQCP) and the following characteristics of the asphalt and completed pavements: air voids, mat density, joint density, grade and Profilograph roughness, if paved area is in excess of 500’ in length**.**

b. Air Voids and Mat density. Acceptance of each lot of plant produced material for mat density and air voids will be based on the percentage of material within specification limits (PWL). If the PWL of the lot equals or exceeds 90%, the lot will be acceptable. Acceptance and payment will be determined in accordance with paragraph 401-8.1.

c. Joint density. Acceptance of each lot of plant produced asphalt for joint density will be based on the PWL. If the PWL of the lot is equal to or exceeds 90%, the lot will be considered acceptable. If the PWL is less than 90%, the Contractor shall evaluate the reason and act accordingly. If the PWL is less than 80%, the Contractor shall cease operations and until the reason for poor compaction has been determined. If the PWL is less than 71%, the pay factor for the lot used to complete the joint will be reduced by five (5) percentage points. This lot pay factor reduction will be incorporated and evaluated in accordance with paragraph 401-8.1.

d. Grade. The final finished surface of the pavement shall be surveyed to verify that the grade elevations and cross-sections shown on the plans do not deviate more than 1/2 inch (12 mm) vertically or 0.1 feet (30 mm) laterally.

Cross-sections of the pavement shall be taken at a minimum 50-foot (15-m) longitudinal spacing, at all longitudinal grade breaks, and at start and end of each lane placed. Minimum cross-section grade points shall include grade at centerline, ± 10 feet of centerline , and edge of taxiway pavement.

The survey and documentation shall be stamped and signed by a licensed surveyor. Payment for sublots that do not meet grade for over 25% of the sublot shall not be more than 95%.

e. Profilograph roughness for QA Acceptance. The final profilograph shall be the full length of the project to facilitate testing of roughness between lots. The Contractor, in the presence of the RPR shall perform a profilograph roughness test on the completed project with a profilograph meeting the requirements of ASTM E1274 or a Class I inertial profiler meeting ASTM E950. Data and results shall be provided within 48 hrs of profilograph roughness tests.

The pavement shall have an average profile index less than 15 inches per mile per 1/10 mile. The equipment shall utilize electronic recording and automatic computerized reduction of data to indicate "must grind" bumps and the Profile Index for the pavement using a 0.2-inch (5 mm) blanking band. The bump template must span one inch (25 mm) with an offset of 0.4 inches (10 mm). The profilograph must be calibrated prior to use and operated by a factory or State DOT approved, trained operator. Profilograms shall be recorded on a longitudinal scale of one inch (25 mm) equals 25 feet (7.5 m) and a vertical scale of one inch (25 mm) equals one inch (25 mm). Profilograph shall be performed one foot right and left of project centerline and 15 feet (4.5 m) right and left of project centerline. Any areas that indicate "must grind" shall be corrected with diamond grinding per paragraph 401-4.16 or by removing and replacing full depth of surface course. as directed by the RPR. Where corrections are necessary, a second profilograph run shall be performed to verify that the corrections produced an average profile index of 15 inches per mile per 1/10 mile or less.

401-6.3 Percentage of material within specification limits (PWL). The PWL will be determined in accordance with procedures specified in Item C-110. The specification tolerance limits (L) for lower and (U) for upper are contained in Table 5.

Table 5. Acceptance Limits for Air Voids and Density

Test Property	Pavements Specification Tolerance Limits	
	L	**U**
Air Voids Total Mix (%)	2.0	5.0
Surface Course Mat Density (%)	92.8	-
Base Course Mat Density (%)	92.0	-
Joint density (%)	90.5	--

a. Outliers. All individual tests for mat density and air voids will be checked for outliers (test criterion) in accordance with ASTM E178, at a significance level of 5%. Outliers will be discarded, and the PWL will be determined using the remaining test values. The criteria in Table 5 is based on production processes which have a variability with the following standard deviations: Surface Course Mat Density (%), 1.30; Base Course Mat Density (%), 1.55; Joint Density (%), 1.55.

The Contractor should note that (1) 90 PWL is achieved when consistently producing a surface course with an average mat density of at least 94.5% with 1.30% or less variability, (2) 90 PWL is achieved when consistently producing a base course with an average mat density of at least 94.0% with 1.55% or less variability, and (3) 90 PWL is achieved when consistently producing joints with an average joint density of at least 92.5% with 1.55% or less variability.

401-6.4 Resampling pavement for mat density.

a. General. Resampling of a lot of pavement will only be allowed for mat density, and then, only if the Contractor requests same, in writing, within 48 hours after receiving the written test results from the RPR. A retest will consist of all the sampling and testing procedures contained in paragraphs 401-6.1d and 401-6.2b. Only one resampling per lot will be permitted.

(1) A redefined PWL will be calculated for the resampled lot. The number of tests used to calculate the redefined PWL will include the initial tests made for that lot plus the retests.

(2) The cost for resampling and retesting shall be borne by the Contractor.

b. Payment for resampled lots. The redefined PWL for a resampled lot will be used to calculate the payment for that lot in accordance with Table 6.

c. Outliers. Check for outliers in accordance with ASTM E178, at a significance level of 5%.

METHOD OF MEASUREMENT

401-7.1 Measurement. Asphalt shall be measured by the number of tons of asphalt used in the accepted work. Batch weights or truck scale weights will be used to determine the basis for the tonnage. No direct measurement or payment shall be made for saw cutting. Saw cutting shall be incidental to the pavement payment item.

BASIS OF PAYMENT

401-8.1 Payment. Payment for a lot of asphalt meeting all acceptance criteria as specified in paragraph 401-6.2 shall be made based on results of tests for mat density and air voids. Payment for acceptable lots shall be adjusted according to paragraph 401-8.1c for mat density and air voids; and paragraph 401-6.2c for joint density, subject to the limitation that:

a. The total project payment for plant mix asphalt pavement shall not exceed 100 percent of the product of the contract unit price and the total number of tons of asphalt used in the accepted work.

b. The price shall be compensation for furnishing all materials, for all preparation, mixing, and placing of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

c. Basis of adjusted payment. The pay factor for each individual lot shall be calculated in accordance with Table 6. A pay factor shall be calculated for both mat density and air voids. The lot pay factor shall be the higher of the two values when calculations for both mat density and air voids are 100% or higher. The lot pay factor shall be the product of the two values when only one of the calculations for

either mat density or air voids is 100% or higher. The lot pay factor shall be the lower of the two values when calculations for both mat density and air voids are less than 100%. If PWL for joint density is less than 71% then the lot pay factor shall be reduced by 5% but be no higher than 95%.

For each lot accepted, the adjusted contract unit price shall be the product of the lot pay factor for the lot and the contract unit price. Payment shall be subject to the total project payment limitation specified in paragraph 401-8.1a. Payment in excess of 100% for accepted lots of asphalt shall be used to offset payment for accepted lots of asphalt pavement that achieve a lot pay factor less than 100%.

Payment for sublots which do not meet grade in accordance with paragraph 401-6.2d after correction for over 25% of the sublot shall be reduced by 5%.

Table 6. Price adjustment schedule[1]

Percentage of material within specification limits (PWL)	Lot pay factor (percent of contract unit price)
96 – 100	106
90 – 95	PWL + 10
75 – 89	0.5 PWL + 55
55 – 74	1.4 PWL – 12
Below 55	Reject [2]

[1] Although it is theoretically possible to achieve a pay factor of 106% for each lot, actual payment above 100% shall be subject to the total project payment limitation specified in paragraph 401-8.1a.

[2] The lot shall be removed and replaced. However, the RPR may decide to allow the rejected lot to remain. In that case, if the RPR and Contractor agree in writing that the lot shall not be removed, it shall be paid for at 50% of the contract unit price and the total project payment shall be reduced by the amount withheld for the rejected lot.

d. Profilograph Roughness. The Contractor will receive full payment when the profilograph average profile index is in accordance with paragraph 401-6.2e. When the final average profile index for the entire length of pavement does not exceed 15 inches per mile per 1/10 mile, payment will be made at the contract unit price for the completed pavement.

401-8.1 Payment.

Payment will be made under:

Item P-401-5.1	PG76-22 Asphalt Surface Course - per ton
Item P-401-5.2	PG70-22 Asphalt Base & Shoulder Surface Course - per ton
Item P-401-5.3	PG70-22 Asphalt Leveling Course - per ton

REFERENCES

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

ASTM International (ASTM)

ASTM C29	Standard Test Method for Bulk Density (“Unit Weight”) and Voids in Aggregate
ASTM C88	Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate
ASTM C117	Standard Test Method for Materials Finer than 75-µm (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C127	Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate
ASTM C131	Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C142	Standard Test Method for Clay Lumps and Friable Particles in Aggregates
ASTM C566	Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying
ASTM D75	Standard Practice for Sampling Aggregates
ASTM D242	Standard Specification for Mineral Filler for Bituminous Paving Mixtures
ASTM D946	Standard Specification for Penetration-Graded Asphalt Cement for Use in Pavement Construction
ASTM D979	Standard Practice for Sampling Asphalt Paving Mixtures
ASTM D1073	Standard Specification for Fine Aggregate for Asphalt Paving Mixtures
ASTM D1188	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Coated Samples
ASTM D2172	Standard Test Method for Quantitative Extraction of Bitumen from Asphalt Paving Mixtures
ASTM D1461	Standard Test Method for Moisture or Volatile Distillates in Asphalt Paving Mixtures
ASTM D2041	Standard Test Method for Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures
ASTM D2419	Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate
ASTM D2489	Standard Practice for Estimating Degree of Particle Coating of Bituminous-Aggregate Mixtures
ASTM D2726	Standard Test Method for Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures
ASTM D2950	Standard Test Method for Density of Bituminous Concrete in Place by Nuclear Methods

ASTM D3203	Standard Test Method for Percent Air Voids in Compacted Dense and Open Bituminous Paving Mixtures
ASTM D3381	Standard Specification for Viscosity-Graded Asphalt Cement for Use in Pavement Construction
ASTM D3665	Standard Practice for Random Sampling of Construction Materials
ASTM D3666	Standard Specification for Minimum Requirements for Agencies Testing and Inspecting Road and Paving Materials
ASTM D4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D4552	Standard Practice for Classifying Hot-Mix Recycling Agents
ASTM D4791	Standard Test Method for Flat Particles, Elongated Particles, or Flat and Elongated Particles in Coarse Aggregate
ASTM D4867	Standard Test Method for Effect of Moisture on Asphalt Concrete Paving Mixtures
ASTM D5361	Standard Practice for Sampling Compacted Asphalt Mixtures for Laboratory Testing
ASTM D5444	Standard Test Method for Mechanical Size Analysis of Extracted Aggregate
ASTM D5821	Standard Test Method for Determining the Percentage of Fractured Particles in Coarse Aggregate
ASTM D6084	Standard Test Method for Elastic Recovery of Bituminous Materials by Ductilometer
ASTM D6307	Standard Test Method for Asphalt Content of Hot Mix Asphalt by Ignition Method
ASTM D6373	Standard Specification for Performance Graded Asphalt Binder
ASTM D6752	Standard Test Method for Bulk Specific Gravity and Density of Compacted Bituminous Mixtures Using Automatic Vacuum Sealing Method
ASTM D6925	Standard Test Method for Preparation and Determination of the Relative Density of Hot Mix Asphalt (HMA) Specimens by Means of the SuperPave Gyratory Compactor.
ASTM D6926	Standard Practice for Preparation of Bituminous Specimens Using Marshall Apparatus
ASTM D6995	Standard Test Method for Determining Field VMA based on the Maximum Specific Gravity of the Mix (Gmm)
ASTM E11	Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves
ASTM E178	Standard Practice for Dealing with Outlying Observations
ASTM E1274	Standard Test Method for Measuring Pavement Roughness Using a Profilograph

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

American Association of State Highway and Transportation Officials (AASHTO)

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

Asphalt Institute (AI)

Asphalt Institute Handbook MS-26, Asphalt Binder

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

AI State Binder Specification Database

Federal Highway Administration (FHWA)

Long Term Pavement Performance Binder Program

Advisory Circulars (AC)

AC 150/5320-6	Airport Pavement Design and Evaluation

FAA Orders

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

Software

FAARFIELD

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Item P-603 Emulsified Asphalt Tack Coat

DESCRIPTION

603-1.1 This item shall consist of preparing and treating an asphalt or concrete surface with asphalt material in accordance with these specifications and in reasonably close conformity to the lines shown on the plans.

MATERIALS

603-2.1 Asphalt materials. The asphalt material shall be an emulsified asphalt as specified in ASTM D3628 as an asphalt application for tack coat appropriate to local conditions. The emulsified asphalt shall not be diluted. The Contractor shall provide a copy of the manufacturer's Certificate of Analysis (COA) for the asphalt material to the Resident Project Representative (RPR) before the asphalt material is applied for review and acceptance. The furnishing of COA for the asphalt material shall not be interpreted as a basis for final acceptance. The manufacturer's COA may be subject to verification by testing the material delivered for use on the project.

CONSTRUCTION METHODS

603-3.1 Weather limitations. The tack coat shall be applied only when the existing surface is dry and the atmospheric temperature is 50°F (10°C) or above; the temperature has not been below 35°F (2°C) for the 12 hours prior to application; and when the weather is not foggy or rainy. The temperature requirements may be waived when directed by the RPR.

603-3.2 Equipment. The Contractor shall provide equipment for heating and applying the emulsified asphalt material. The emulsion shall be applied with a manufacturer-approved computer rate-controlled asphalt distributor. The equipment shall be in good working order and contain no contaminants or diluents in the tank. Spray bar tips must be clean, free of burrs, and of a size to maintain an even distribution of the emulsion. Any type of tip or pressure source is suitable that will maintain predetermined flow rates and constant pressure during the application process with application speeds under eight (8) miles per hour (13 km per hour) or seven (700) feet per minute (213 m per minute).

The equipment will be tested under pressure for leaks and to ensure proper set-up before use to verify truck set-up (via a test-shot area), including but not limited to, nozzle tip size appropriate for application, spray-bar height and pressure and pump speed, evidence of triple-overlap spray pattern, lack of leaks, and any other factors relevant to ensure the truck is in good working order before use.

The distributor truck shall be equipped with a minimum 12-foot (3.7-m) spreader spray bar with individual nozzle control with computer-controlled application rates. The distributor truck shall have an easily accessible thermometer that constantly monitors the temperature of the emulsion, and have an operable mechanical tank gauge that can be used to cross-check the computer accuracy. If the distributor is not equipped with an operable quick shutoff valve, the prime operations shall be started and stopped on building paper.

The distributor truck shall be equipped to effectively heat and mix the material to the required temperature prior to application as required. Heating and mixing shall be done in accordance with the manufacturer's recommendations. Do not overheat or over mix the material.

The distributor shall be equipped with a hand sprayer.

Asphalt distributors must be calibrated annually in accordance with ASTM D2995. The Contractor must furnish a current calibration certification for the asphalt distributor truck from any State or other agency as approved by the RPR.

A power broom and/or power blower suitable for cleaning the surfaces to which the asphalt tack coat is to be applied shall be provided.

603-3.3 Application of emulsified asphalt material. The emulsified asphalt shall not be diluted. Immediately before applying the emulsified asphalt tack coat, the full width of surface to be treated shall be swept with a power broom and/or power blower to remove all loose dirt and other objectionable material.

The emulsified asphalt material shall be uniformly applied with an asphalt distributor at the rates appropriate for the conditions and surface specified in the table below. The type of asphalt material and application rate shall be approved by the RPR prior to application.

Emulsified Asphalt

Surface Type	Residual Rate, gal/SY (L/square meter)	Emulsion Application Bar Rate, gal/SY (L/square meter)
New asphalt	0.02-0.05 (0.09-0.23)	0.03-0.07 (0.13-0.32)
Existing asphalt	0.04-0.07 (0.18-0.32)	0.06-0.11 (0.27-0.50)
Milled Surface	0.04-0.08 (0.18-0.36)	.0.06-0.12 (0.27-0.54)
Concrete	0.03-0.05 (0.13-0.23)	0.05-0.08 (0.23-0.36)

After application of the tack coat, the surface shall be allowed to cure without being disturbed for the period of time necessary to permit drying and setting of the tack coat. This period shall be determined by the RPR. The Contractor shall protect the tack coat and maintain the surface until the next course has been placed. When the tack coat has been disturbed by the Contractor, tack coat shall be reapplied at the Contractor's expense.

603-3.4 Freight and waybills The Contractor shall submit waybills and delivery tickets, during progress of the work. Before the final statement is allowed, file with the RPR certified waybills and certified delivery tickets for all emulsified asphalt materials used in the construction of the pavement covered by the contract. Do not remove emulsified asphalt material from storage until the initial outage and temperature measurements have been taken. The delivery or storage units will not be released until the final outage has been taken.

METHOD OF MEASUREMENT

603-4.1 The emulsified asphalt material for tack coat shall be measured by the gallon. Volume shall be corrected to the volume at 60°F (16°C) in accordance with ASTM D1250. The emulsified asphalt material paid for will be the measured quantities used in the accepted work, provided that the measured quantities are not 10% over the specified application rate. Any amount of emulsified asphalt material more than 10% over the specified application rate for each application will be deducted from the measured quantities, except for irregular areas where hand spraying of the emulsified asphalt material is necessary. Water added to emulsified asphalt will not be measured for payment.

BASIS OF PAYMENT

603.5-1 Payment shall be made at the contract unit price per gallon of emulsified asphalt material. This price shall be full compensation for furnishing all materials, for all preparation, delivery, and application of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-603-01	Emulsified Asphalt Tack Coat - per gallon

REFERENCES

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

ASTM International (ASTM)

ASTM D1250	Standard Guide for Use of the Petroleum Measurement Tables
ASTM D2995	Standard Practice for Estimating Application Rate and Residual Application Rate of Bituminous Distributors
ASTM D3628	Standard Practice for Selection and Use of Emulsified Asphalts

END ITEM P-603

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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 ASTM D5893 and be jet fuel resistant.

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, seven days prior to use on the project.

a. Tractor-mounted routing tool. Provide a routing tool, used for removing old sealant from the joints, of such shape and dimensions and so mounted on the tractor that it will not damage the sides of the joints. The tool shall be designed so that it can be adjusted to remove the old material to varying depths as required. The use of V-shaped tools or rotary impact routing devices will not be permitted. Hand-operated spindle routing devices may be used to clean and enlarge random cracks.

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. The Contractor must demonstrate sandblasting equipment including the air compressor, hose, guide and nozzle size, under job conditions, before approval in accordance with paragraph 605-3.3. The Contractor shall demonstrate, in the presence of the Resident Project Representative (RPR), that the method cleans the joint and does not damage the joint.

d. Waterblasting equipment. The Contractor must demonstrate waterblasting equipment including the pumps, hose, guide and nozzle size, under job conditions, before approval in accordance with paragraph 605-3.3. The Contractor shall demonstrate, in the presence of the RPR, that the method cleans the joint and does not damage the joint.

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. Cold-applied, single-component sealing equipment. The equipment for installing ASTM D5893 single component joint sealants shall consist of an extrusion pump, air compressor, following plate, hoses, and nozzle for transferring the sealant from the storage container into the joint opening. The dimension of the nozzle shall be such that the tip of the nozzle will extend into the joint to allow sealing from the bottom of the joint to the top. Maintain the initially approved equipment in good working condition, serviced in accordance with the supplier's instructions, and unaltered in any way without obtaining prior approval. Small hand-held air-powered equipment (i.e., caulking guns) may be used for small applications.

605-3.3 Preparation of joints. Pavement joints 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. Cleaning shall be accomplished by sandblasting, tractor-mounted routing equipment, concrete saw, or waterblaster as specified in paragraph 605-3.2. The newly exposed concrete joint faces and the pavement surface extending a minimum of 1/2 inch (12 mm) from the joint edge shall be sandblasted clean. Sandblasting shall be accomplished in a minimum of two passes. One pass per joint face with the nozzle held at an angle directly toward the joint face and not more than 3 inches (75 mm) from it. 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 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 (15 m) ahead of the joint sealing operations, perform a final cleaning with compressed air. Fill the joints from the bottom up to 1/8 inch ±1/16 inch (2 mm) 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.

605-3.5 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.

605-3.6 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 Joint sealing material shall not be measured, as is shall be considered incidental to work completed under specification P-501

BASIS OF PAYMENT

605-5.1 There shall be no direct payment for joint sealing material.

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

Advisory Circulars (AC)

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

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Item P-606 Adhesive Compounds, Two-Component for Sealing Wire and Lights in Pavement

DESCRIPTION

606-1.1 This specification covers two types of material; a liquid suitable for sealing electrical wire in saw cuts in pavement and for sealing light fixtures or bases in pavement, and a paste suitable for embedding light fixtures in the pavement. Both types of material are two-component filled formulas with the characteristics specified in paragraph 606-2.4. Materials supplied for use with asphalt and/or concrete pavements must be formulated so they are compatible with the asphalt and/or concrete.

MATERIALS

606-2.1 Curing. When pre-warmed to 77°F (25°C), mixed, and placed in accordance with manufacturer's directions, the materials shall cure at temperatures of 45°F (7°C) or above without the application of external heat.

606-2.2 Storage. The adhesive components shall not be stored at temperatures over 86°F (30°C), unless otherwise specified by the manufacturer.

606-2.3 Caution. Installation and use shall be in accordance with the manufacturer's recommended procedures. Avoid prolonged or repeated contact with skin. In case of contact, wash with soap and flush with water. If taken internally, call doctor. Keep away from heat or flame. Avoid vapor. Use in well-ventilated areas. Keep in cool place. Keep away from children.

606-2.4 Characteristics. When mixed and cured in accordance with the manufacturer's directions, the materials shall have the following properties shown in Table 1.

Table 1. Property Requirements

Physical or Electrical Property	Minimum	Maximum	ASTM Method
Tensile			
Portland cement concrete	1,000 psi (70 kg/sq cm)		D 638
Asphalt concrete	500 psi (35 kg/sq cm)		
Elongation			
Portland cement concrete		See note [1]	D 638
Asphalt concrete	50%		D 638
Coef. of cub. exp. cu. cm/cu. cm/°C	0.00090	0.00120	D 1168
Coef. of lin. exp. cm/cm/°C	0.000030	0.000040	D 1168
Dielectric strength, short time test	350 volts/mil.		D 149
Arc resistance	125 sec		
Pull-off			
Adhesion to steel	1,000 psi (70 kg/sq cm)		
Adhesion to Portland cement concrete	200 psi (14 kg/sq cm)		
Adhesion to asphalt concrete	No test available.		
Adhesion to aluminum	250 psi		

[1] 20% or more (without filler) for formulations to be supplied for areas subject to freezing.

SAMPLING, INSPECTION, AND TEST PROCEDURES

606-3.1 Tensile properties. Tests for tensile strength and elongation shall be conducted in accordance with ASTM D638.

606-3.2 Expansion. Tests for coefficients of linear and cubical expansion shall be conducted in accordance with, Method B, except that mercury shall be used instead of glycerine. The test specimen shall be mixed in the proportions specified by the manufacturer, and cured in a glass tub approximately 2 inch (50 mm) long by 3/8 inch (9 mm) in diameter. The interior of the tube shall be precoated with a silicone mold release agent. The hardened sample shall be removed from the tube and aged at room temperature for one (1) week before conducting the test. The test temperature range shall be from 35°F (2°C) to 140°F (60°C).

606-3.3 Test for dielectric strength. Test for dielectric strength shall be conducted in accordance with ASTM D149 for sealing compounds to be furnished for sealing electrical wires in pavement.

606-3.4 Test for arc resistance. Test for arc resistance shall be conducted for sealing compounds to be furnished for sealing electrical wires in pavement.

606-3.5 Test for adhesion to steel. The ends of two smooth, clean, steel specimens of convenient size (1 inch by 1 inch by 6 inch) (25 mm by 25 mm by 150 mm) would be satisfactory when bonded together with adhesive mixture and allowed to cure at room temperature for a period of time to meet formulation requirements and then tested to failure on a Riehle (or similar) tensile tester. The thickness of adhesive to be tested shall be 1/4 inch (6 mm).

606-3.6 Adhesion to Portland cement concrete

a. Concrete test block preparation. The aggregate grading shall be as shown in Table 2.

The coarse aggregate shall consist of crushed rock having a minimum of 75% of the particles with at least one fractured face and having a water absorption of not more than 1.5%. The fine aggregate shall consist of crushed sand manufactured from the same parent rock as the coarse aggregate. The concrete shall have a water-cement ratio of 5.5 gallons (21 liters) of water per bag of cement, a cement factor of 6, ±0.5, bags of cement per cubic yard (0.76 cubic meter) of concrete, and a slump of 2-1/2 inch (60 mm), ±1/2 inch (60 mm ±12 mm). The ratio of fine aggregate to total aggregate shall be approximately 40% by solid volume. The air content shall be 5.0%, ±0.5%, and it shall be obtained by the addition to the batch of an air-entraining admixture such as Vinsol® resin. The mold shall be of metal and shall be provided with a metal base plate.

Means shall be provided for securing the base plate to the mold. The assembled mold and base plate shall be watertight and shall be oiled with mineral oil before use. The inside measurement of the mold shall be such that several one inch (25 mm) by 2-inch (75 mm) by 3-inch (25 mm by 50 mm by 75 mm) test blocks can be cut from the specimen with a concrete saw having a diamond blade. The concrete shall be prepared and cured in accordance with ASTM C192.

Table 2. Aggregate for Bond Test Blocks

Type	Sieve Size	Percent Passing
Coarse Aggregate	3/4 inch (19.0 mm)	97 to 100
	1/2 inch (12.5 mm)	63 to 69
	3/8 inch (9.5 mm)	30 to 36
	No. 4 (4.75 mm)	0 to 3
Fine Aggregate	No. 4 (4.75 mm)	100
	No. 8 (2.36 mm)	82 to 88
	No. 16 (1.18 mm)	60 to 70
	No. 30 (600 µm)	40 to 50
	No. 50 (300 µm)	16 to 26
	No. 100 (150 µm)	5 to 9

b. Bond test. Prior to use, oven-dry the test blocks to constant weight at a temperature of 220°F to 230°F (104°C to 110°C), cool to room temperature, 73.4°F ±3°F (23°C ±1.6°C), in a desiccator, and clean the surface of the blocks of film or powder by vigorous brushing with a stiff-bristled fiber brush. Two test blocks shall be bonded together on the one inch by 3 inch (25 mm by 75 mm) sawed face with the adhesive mixture and allowed to cure at room temperature for a period of time to meet formulation requirements and then tested to failure in a Riehle (or similar) tensile tester. The thickness of the adhesive to be tested shall be 1/4 inch (6 mm).

606-3.7 Compatibility with asphalt mix. Test for compatibility with asphalt in accordance with ASTM D5329.

606-3.8 Adhesive compounds - Contractor's responsibility. The Contractor shall furnish the vendor's certified test reports for each batch of material delivered to the project. The report shall certify that the material meets specification requirements and is suitable for use with **[** concrete **] [** asphalt concrete **]** pavements. The report shall be provided to and accepted by the Resident Project Representative (RPR) before use of the material. In addition, the Contractor shall obtain a statement from the supplier or manufacturer that guarantees the material for one year. The supplier or manufacturer shall furnish evidence that the material has performed satisfactorily on other projects.

606-3.9 Application. Adhesive shall be applied on a dry, clean surface, free of grease, dust, and other loose particles. The method of mixing and application shall be in strict accordance with the manufacturer's recommendations. When used with Item P-605, such as light can installation, Item P-605 shall not be applied until the Item P-606 has fully cured.

METHOD OF MEASUREMENT

606-4.1 When required in the installation of an in-pavement lighting system or portion thereof, no measurement will be made for direct payment of adhesive, as the cost of furnishing and installing shall be considered as a subsidiary obligation in the completion of the installation

BASIS OF PAYMENT

606-5.1 No direct payment shall be made for sealant. Where applicable, the cost of sealant shall be incidental to the items that require it.

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 C192	Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory
ASTM D149	Standard Test Method for Dielectric Breakdown Voltage and Dielectric Strength of Solid Electrical Insulating Materials at Commercial Power Frequencies
ASTM D638	Standard Test Method for Tensile Properties of Plastics
ASTM D5329	Standard Test Methods for Sealants and Fillers, Hot-applied, for Joints and Cracks in Asphaltic and Portland Cement Concrete Pavements

END OF ITEM P-606

Item P-610 Concrete for Miscellaneous Structures

DESCRIPTION

610-1.1 This item shall consist of concrete and reinforcement, as shown on the plans, prepared and constructed in accordance with these specifications. This specification shall be used for all concrete other than airfield pavement which are cast-in-place.

MATERIALS

610-2.1 General. Only approved materials, conforming to the requirements of these specifications, shall be used in the work. Materials may be subject to inspection and tests at any time during their preparation or use. The source of all materials shall be approved by the Resident Project Representative (RPR) before delivery or use in the work. Representative preliminary samples of the materials shall be submitted by the Contractor, when required, for examination and test. Materials shall be stored and handled to ensure preservation of their quality and fitness for use and shall be located to facilitate prompt inspection. All equipment for handling and transporting materials and concrete must be clean before any material or concrete is placed in them.

The use of pit-run aggregates shall not be permitted unless the pit-run aggregate has been screened and washed, and all fine and coarse aggregates stored separately and kept clean. The mixing of different aggregates from different sources in one storage stockpile or alternating batches of different aggregates shall not be permitted.

a. Reactivity. Fine aggregate and coarse aggregates to be used in all concrete shall have been tested separately within six months of the project in accordance with ASTM C1260. Test results shall be submitted to the RPR. The aggregate shall be considered innocuous if the expansion of test specimens, tested in accordance with ASTM C1260, does not exceed 0.08% at 14 days (16 days from casting). If the expansion either or both test specimen is greater than 0.08% at 14 days, but less than 0.20%, a minimum of 25% of Type F fly ash, or between 40% and 55% of slag cement shall be used in the concrete mix.

If the expansion is greater than 0.20% the aggregates shall not be used, and test results for other aggregates must be submitted for evaluation; or aggregates that meet P-501 reactivity test requirements may be utilized.

610-2.2 Coarse aggregate. The coarse aggregate for concrete shall meet the requirements of ASTM C33 and the requirements of Table 4, Class Designation 5S; and the grading requirements shown below, as required for the project.

Coarse Aggregate Grading Requirements

Maximum Aggregate Size	ASTM C33, Table 3 Grading Requirements (Size No.)
1 1/2 inch (37.5 mm)	467 or 4 and 67
1 inch (25 mm)	57
¾ inch (19 mm)	67
½ inch (12.5 mm)	7

610-2.2.1 Coarse Aggregate susceptibility to durability (D) cracking. Coarse aggregate may only be accepted from sources that have a 20-year service history for the same gradation to be supplied with no history of D-Cracking. Aggregates that do not have a 20-year record of service free from major repairs (less than 5% of slabs replaced) in similar conditions without D-cracking shall not be used unless the material currently being produced has a durability factor greater than or equal to 95 per ASTM C666. The Contractor shall submit a current certification and test results to verify the aggregate acceptability. Test results will only be accepted from a State Department of Transportation (DOT) materials laboratory or an accredited laboratory. Certification and test results which are not dated or which are over one (1) year old or which are for different gradations will not be accepted.

Crushed granite, calcite cemented sandstone, quartzite, basalt, diabase, rhyolite or trap rock are considered to meet the D-cracking test requirements but must meet all other quality tests specified in Item P-501.

610-2.3 Fine aggregate. The fine aggregate for concrete shall meet all fine aggregate requirements of ASTM C33.

610-2.4 Cement. Cement shall conform to the requirements of ASTM C150 Type I.

610-2.5 Cementitious materials.

a. Fly ash. Fly ash shall meet the requirements of ASTM C618, with the exception of loss of ignition, where the maximum shall be less than 6%. Fly ash shall have a Calcium Oxide (CaO) content of less than 15% and a total available alkali content less than 3% per ASTM C311. Fly ash produced in furnace operations using liming materials or soda ash (sodium carbonate) as an additive shall not be acceptable. The Contractor shall furnish the previous three most recent, consecutive ASTM C618 reports for each source of fly ash proposed in the concrete mix, and shall furnish each additional report as they become available during the project. The reports can be used for acceptance or the material may be tested independently by the RPR.

b. Slag cement (ground granulated blast furnace (GGBF)). Slag cement shall conform to ASTM C989, Grade 100 or Grade 120. Slag cement shall be used only at a rate between 25% and 55% of the total cementitious material by mass.

610-2.6 Water. Water used in mixing or curing shall be from potable water sources. Other sources shall be tested in accordance with ASTM C1602 prior to use.

610-2.7 Admixtures. The Contractor shall submit certificates indicating that the material to be furnished meets all of the requirements indicated below. In addition, the RPR may require the Contractor to submit complete test data from an approved laboratory showing that the material to be furnished meets all of the requirements of the cited specifications. Subsequent tests may be made of samples taken by the RPR from

the supply of the material being furnished or proposed for use on the work to determine whether the admixture is uniform in quality with that approved.

a. Air-entraining admixtures. Air-entraining admixtures shall meet the requirements of ASTM C260 and shall consistently entrain the air content in the specified ranges under field conditions. The air-entrainment agent and any water reducer admixture shall be compatible.

b. Water-reducing admixtures. Water-reducing admixture shall meet the requirements of ASTM C494, Type A, B, or D. ASTM C494, Type F and G high range water reducing admixtures and ASTM C1017 flowable admixtures shall not be used.

c. Other chemical admixtures. The use of set retarding, and set-accelerating admixtures shall be approved by the RPR. Retarding shall meet the requirements of ASTM C494, Type A, B, or D and set-accelerating shall meet the requirements of ASTM C494, Type C. Calcium chloride and admixtures containing calcium chloride shall not be used.

610-2.8 Premolded joint material. Premolded joint material for expansion joints shall meet the requirements of ASTM D1751**.**

610-2.9 Joint filler. The filler for joints shall meet the requirements of Item P-605, unless otherwise specified.

610-2.10 Steel reinforcement. Reinforcing when required shall be indicated on the typical detail for each item requiring structural concrete. Reinforcing shall conform to the following:

Reinforcing Steel	ASTM A615, ASTM A706, ASTM A775, ASTM A934
Welded Steel Wire Fabric	ASTM A1064, ASTM A884
Welded Deformed Steel Fabric	ASTM A1064
Bar Mats	ASTM A184 or ASTM A704

610-2.11 Materials for curing concrete. Curing materials shall conform to the following:

Waterproof paper	ASTM C171
Clear or white Polyethylene Sheeting	ASTM C171
White-pigmented Liquid Membrane-Forming Compound, Type 2, Class B	ASTM C309

CONSTRUCTION METHODS

610-3.1 General. The Contractor shall furnish all labor, materials, and services necessary for, and incidental to, the completion of all work as shown on the drawings and specified here. All machinery and equipment used by the Contractor on the work, shall be of sufficient size to meet the requirements of the work. All work shall be subject to the inspection and approval of the RPR.

610-3.2 Concrete Mixture. The concrete shall develop a compressive strength of 4000 psi in 28 days as determined by test cylinders made in accordance with ASTM C31 and tested in accordance with ASTM C39. The concrete shall contain not less than 470 pounds of cementitious material per cubic yard (280 kg per cubic meter). The water cementitious ratio shall not exceed 0.45 by weight. The air content of the concrete shall be 5% +/- 1.2% as determined by ASTM C231 and shall have a slump of not more than 4 inches (100 mm) as determined by ASTM C143.

610-3.3 Mixing. Concrete may be mixed at the construction site, at a central point, or wholly or in part in truck mixers. The concrete shall be mixed and delivered in accordance with the requirements of ASTM C94 or ASTM C685.

The concrete shall be mixed only in quantities required for immediate use. Concrete shall not be mixed while the air temperature is below 40°F (4°C) without the RPRs approval. If approval is granted for mixing under such conditions, aggregates or water, or both, shall be heated and the concrete shall be placed at a temperature not less than 50°F (10°C) nor more than 100°F (38°C). The Contractor shall be held responsible for any defective work, resulting from freezing or injury in any manner during placing and curing, and shall replace such work at his expense.

Retempering of concrete by adding water or any other material is not permitted.

The rate of delivery of concrete to the job shall be sufficient to allow uninterrupted placement of the concrete.

610-3.4 Forms. Concrete shall not be placed until all the forms and reinforcements have been inspected and approved by the RPR. Forms shall be of suitable material and shall be of the type, size, shape, quality, and strength to build the structure as shown on the plans. The forms shall be true to line and grade and shall be mortar-tight and sufficiently rigid to prevent displacement and sagging between supports. The surfaces of forms shall be smooth and free from irregularities, dents, sags, and holes. The Contractor shall be responsible for their adequacy.

The internal form ties shall be arranged so no metal will show in the concrete surface or discolor the surface when exposed to weathering when the forms are removed. All forms shall be wetted with water or with a non-staining mineral oil, which shall be applied immediately before the concrete is placed. Forms shall be constructed so they can be removed without injuring the concrete or concrete surface.

610-3.5 Placing reinforcement. All reinforcement shall be accurately placed, as shown on the plans, and shall be firmly held in position during concrete placement. Bars shall be fastened together at intersections. The reinforcement shall be supported by approved metal chairs. Shop drawings, lists, and bending details shall be supplied by the Contractor when required.

610-3.6 Embedded items. Before placing concrete, all embedded items shall be firmly and securely fastened in place as indicated. All embedded items shall be clean and free from coating, rust, scale, oil, or any foreign matter. The concrete shall be spaded and consolidated around and against embedded items. The embedding of wood shall not be allowed.

610-3.7 Concrete Consistency. The Contractor shall monitor the consistency of the concrete delivered to the project site; collect each batch ticket; check temperature; and perform slump tests on each truck at the project site in accordance with ASTM C143.

610-3.8 Placing concrete. All concrete shall be placed during daylight hours, unless otherwise approved. The concrete shall not be placed until the depth and condition of foundations, the adequacy of forms and falsework, and the placing of the steel reinforcing have been approved by the RPR. Concrete shall be placed as soon as practical after mixing, but in no case later than one (1) hour after water has been added to the mix. The method and manner of placing shall avoid segregation and displacement of the reinforcement. Troughs, pipes, and chutes shall be used as an aid in placing concrete when necessary. The concrete shall not be dropped from a height of more than 5 feet (1.5 m). Concrete shall be deposited as nearly as practical in its final position to avoid segregation due to rehandling or flowing. Do not subject concrete to procedures which cause segregation. Concrete shall be placed on clean, damp surfaces, free from running water, or on a properly consolidated soil foundation.

610-3.9 Vibration. Vibration shall follow the guidelines in American Concrete Institute (ACI) Committee 309R, Guide for Consolidation of Concrete.

610-3.10 Joints. Joints shall be constructed as indicated on the plans.

610-3.11 Finishing. All exposed concrete surfaces shall be true, smooth, and free from open or rough areas, depressions, or projections. All concrete horizontal plane surfaces shall be brought flush to the proper elevation with the finished top surface struck-off with a straightedge and floated.

610-3.12 Curing and protection. All concrete shall be properly cured in accordance with the recommendations in American Concrete Institute (ACI) 308R, Guide to External Curing of Concrete. The concrete shall be protected from damage until project acceptance.

610-3.13 Cold weather placing. When concrete is placed at temperatures below 40°F (4°C), follow the cold weather concreting recommendations found in ACI 306R, Cold Weather Concreting.

610-3.14 Hot weather placing. When concrete is placed in hot weather greater than 85ºF (30 ºC), follow the hot weather concreting recommendations found in ACI 305R, Hot Weather Concreting.

QUALITY ASSURANCE (QA)

610-4.1 Quality Assurance sampling and testing. Concrete for each day's placement will be accepted on the basis of the compressive strength specified in paragraph 610-3.2. The RPR will sample the concrete in accordance with ASTM C172; test the slump in accordance with ASTM C143; test air content in accordance with ASTM C231; make and cure compressive strength specimens in accordance with ASTM C31; and test in accordance with ASTM C39. The QA testing agency will meet the requirements of ASTM C1077.

The Contractor shall provide adequate facilities for the initial curing of cylinders.

610-4.2 Defective work. Any defective work that cannot be satisfactorily repaired as determined by the RPR, shall be removed and replaced at the Contractor's expense. Defective work includes, but is not limited to, uneven dimensions, honeycombing and other voids on the surface or edges of the concrete.

METHOD OF MEASUREMENT

610-5.1 Concrete shall be considered incidental, and no separate measurement shall be made of concrete complete in place and accepted.

BASIS OF PAYMENT

610-6.1 Concrete shall be considered incidental to the items that require its use and no separate payment shall be made.

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 A184	Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement
ASTM A615	Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A704	Standard Specification for Welded Steel Plain Bar or Rod Mats for Concrete Reinforcement

ASTM A706	Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement
ASTM A775	Standard Specification for Epoxy-Coated Steel Reinforcing Bars
ASTM A884	Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement
ASTM A934	Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars
ASTM A1064	Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete
ASTM C31	Standard Practice for Making and Curing Concrete Test Specimens in the Field
ASTM C33	Standard Specification for Concrete Aggregates
ASTM C39	Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
ASTM C94	Standard Specification for Ready-Mixed Concrete
ASTM C136	Standard Test Method for Sieve or Screen Analysis of Fine and Coarse Aggregates
ASTM C114	Standard Test Methods for Chemical Analysis of Hydraulic Cement
ASTM C136	Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates
ASTM C143	Standard Test Method for Slump of Hydraulic-Cement Concrete
ASTM C150	Standard Specification for Portland Cement
ASTM C171	Standard Specification for Sheet Materials for Curing Concrete
ASTM C172	Standard Practice for Sampling Freshly Mixed Concrete
ASTM C231	Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method
ASTM C260	Standard Specification for Air-Entraining Admixtures for Concrete
ASTM C309	Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete
ASTM C311	Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete
ASTM C494	Standard Specification for Chemical Admixtures for Concrete
ASTM C618	Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
ASTM C666	Standard Test Method for Resistance of Concrete to Rapid Freezing and Thawing
ASTM C685	Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing
ASTM C989	Standard Specification for Slag Cement for Use in Concrete and Mortars

ASTM C1017	Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete
ASTM C1077	Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation
ASTM C1157	Standard Performance Specification for Hydraulic Cement
ASTM C1260	Standard Test Method for Potential Alkali Reactivity of Aggregates (Mortar-Bar Method)
ASTM C1365	Standard Test Method for Determination of the Proportion of Phases in Portland Cement and Portland-Cement Clinker Using X-Ray Powder Diffraction Analysis
ASTM C1602	Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete
ASTM D1751	Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Asphalt Types)
ASTM D1752	Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction

American Concrete Institute (ACI)

ACI 305R	Hot Weather Concreting
ACI 306R	Cold Weather Concreting
ACI 308R	Guide to External Curing of Concrete
ACI 309R	Guide for Consolidation of Concrete

END OF ITEM P-610

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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**
Waterborne Type I or II	White	37925	115 ft2/gal (2.8 m2/l)	Type III	10 lb/gal (1.2 kg/l)
Waterborne Type I or II	Red	31136	115 ft2/gal (2.8 m2/l)	Type I Gradation A	5 lb/gal (0.85 kg/l)
Waterborne Type I or II	Yellow	33538 or 33655	115 ft2/gal (2.8 m2/l)	Type III	10 lb/gal (1.2 kg/l)
Waterborne Type I or II	Black	37038	115 ft2/gal (2.8 m2/l)	None	None
50% Marking Waterborne Type I or II	White	37925	230 ft2/gal (5.6 m2/l)	No beads	No beads
50% Marking Waterborne Type I or II	Red	31136	230 ft2/gal (5.6 m2/l)	No beads	No beads
50% Marking Waterborne Type I or II	Yellow	33538 or 33655	230 ft2/gal (5.6 m2/l)	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 III **.**

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. A period of a minimum 30 days to maximum 37 days shall elapse between placement of surface course or seal coat and application of the permanent paint markings. Paint shall be applied at the locations and to the dimensions and spacing shown on the plans. Paint shall not be applied until the layout and condition of the surface has been approved by the 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.

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, by the contractor in the presence of the RPR, using 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. Reflectance shall be verified at a minimum of two times a day.

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 markings (installed or removed) shall be paid for shall be measured by the number of square feet

BASIS OF PAYMENT

620-5.1 This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item complete in place and accepted by the RPR in accordance with these specifications.

620-5.2 Payment for markings (installed or removed) shall be made at the contract price for the number of square feet of painting. This price shall be full compensation for furnishing all materials, including beads, and for all labor, equipment, tools, and incidentals necessary to complete the item, and shall include all surface preparation and reflective media, when applicable

620-5.3 Payment for half rate (50%) markings shall be made at the contract price for the number of square feet of painting. This price shall be full compensation for furnishing all materials and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item P-620-5.1	Airport Pavement Marking, 50% Rate, Yellow – per square foot
Item P-620-5.2	Airport Pavement Marking, Yellow, with Reflective Media – per square foot
Item P-620-5.3	Airport Pavement Marking, Black – per square foot
Item P-620-5.4	Surface Painted Hold Position – per each
Item P-620-5.5	Remove Pavement Marking – 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

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Item T-901 Seeding

DESCRIPTION

901-1.1 This item shall consist of soil preparation, seeding liming, and fertilizing the areas shown on the plans or as directed by the RPR in accordance with these specifications.

MATERIALS

901-2.1 Seed. The species and application rates of grass, legume, and cover-crop seed furnished shall be those stipulated herein. Seed shall conform to the requirements of Federal Specification JJJ-S-181, Federal Specification, Seeds, Agricultural.

Seed shall be furnished separately or in mixtures in standard containers labeled in conformance with the Agricultural Marketing Service (AMS) Seed Act and applicable state seed laws with the seed name, lot number, net weight, percentages of purity and of germination and hard seed, and percentage of maximum weed seed content clearly marked for each kind of seed. The Contractor shall furnish the RPR duplicate signed copies of a statement by the vendor certifying that each lot of seed has been tested by a recognized laboratory for seed testing within six (6) months of date of delivery. This statement shall include: name and address of laboratory, date of test, lot number for each kind of seed, and the results of tests as to name, percentages of purity and of germination, and percentage of weed content for each kind of seed furnished, and, in case of a mixture, the proportions of each kind of seed. Wet, moldy, or otherwise damaged seed will be rejected.

Seeds shall be applied as follows:

Seed Properties and Rate of Application

Seed	Minimum Seed Purity (Percent)	Minimum Germination (Percent)	Rate of Application lb./acre	
			Min	Max
Tall Fescue (KY)	95% minimum	80% minimum	70	87.5
Creeping Red Fescue	96% minimum	85% minimum	70	70
Perennial Ryegrass	98% minimum	90% minimum	8.75	35
Red Top	95% minimum	80% minimum	0	8.75

The seed mixture sowing rate shall be 175 lbs./acre (4 lb./1,000SF) All

seed shall have less than one (1%) percent weed content.

All seed shall be from the same or previous year's crop, unless recent tests from an approved testing agency demonstrate that older seed meets the above requirements.

Seeding shall be performed during the period between **spring** and late Summer/Early Fall (prior to September 1st) inclusive, unless otherwise approved by the RPR.

901-2.2 Lime. Lime shall be ground limestone containing not less than 85% of total carbonates and shall be ground to such fineness that 90% will pass through a No. 20 (850 µm) mesh sieve and 50% will pass through a No. 100 (150 µm) mesh sieve. Coarser material will be acceptable, providing the rates of application are increased to provide not less than the minimum quantities and depth specified in the special provisions on the basis of the two sieve requirements above. Dolomitic lime or a high magnesium lime shall contain at least 10% of magnesium oxide. Lime shall be applied at the rate of 33lb/1,000SF (1,438lb/acre). All liming materials shall conform to the requirements of ASTM C602. .
Liquid lime may be substituted for agricultural ground limestone when seeding hydraulically. Liquid lime shall be a water soluble solution applied at a rate of 1 cup/1,000SF. Liquid lime shall be one-part lime with a minimum of 10 parts water.

901-2.3 Fertilizer. Fertilizer shall be standard commercial fertilizers supplied separately or in mixtures containing the percentages of total nitrogen, available phosphoric acid, and water-soluble potash. They shall be applied at the rate and to the depth specified and shall meet the requirements of applicable state laws. They shall be furnished in standard containers with name, weight, and guaranteed analysis of contents clearly marked thereon. No cyanamide compounds or hydrated lime shall be permitted in mixed fertilizers.

The fertilizers may be supplied in one of the following forms:

a. A dry, free-flowing fertilizer suitable for application by a common fertilizer spreader;

b. A finely-ground fertilizer soluble in water, suitable for application by power sprayers; or
c. A granular or pellet form suitable for application by blower equipment.

Fertilizers shall be 20% Nitrogen, 10% Phosphorus, 20% Potassium commercial fertilizer and shall be spread at the rate of 9 lbs./1,000SF (392 pounds per acre).

901-2.4 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

901-3.1 Advance preparation and cleanup. After grading of areas has been completed and before applying fertilizer and ground limestone, areas to be seeded shall be raked or otherwise cleared of stones larger than 2 inches (50 mm) in any diameter, sticks, stumps, and other debris that might interfere with sowing of seed, growth of grasses, or subsequent maintenance of grass-covered areas. If any damage by erosion or other causes has occurred after the completion of grading and before beginning the application of fertilizer and ground limestone, the Contractor shall repair such damage include filling gullies, smoothing irregularities, and repairing other incidental damage.

An area to be seeded shall be considered a satisfactory seedbed without additional treatment if it has recently been thoroughly loosened and worked to a depth of not less than 5 inches (125 mm) as a result of grading operations and, if immediately prior to seeding, the top 3 inches (75 mm) of soil is loose, friable, reasonably free from large clods, rocks, large roots, or other undesirable matter, and if shaped to the required grade.

When the area to be seeded is sparsely sodded, weedy, barren, and unworked, or packed and hard, any grass and weeds shall first be cut or otherwise satisfactorily disposed of, and the soil then scarified or otherwise loosened to a depth not less than 5 inches (125 mm). Clods shall be broken and the top 3 inches

(75 mm) of soil shall be worked into a satisfactory seedbed by discing, or by use of cultipackers, rollers, drags, harrows, or other appropriate means.

901-3.2 Dry application method.

a. Liming. Not required.

b. Fertilizing. Not required.

c. Seeding. Grass seed shall be sown at the rate specified in paragraph 901-2.1 immediately after fertilizing. The fertilizer and seed shall be raked within the depth range stated in the special provisions. Seeds of legumes, either alone or in mixtures, shall be inoculated before mixing or sowing, in accordance with the instructions of the manufacturer of the inoculant. When seeding is required at other than the seasons shown on the plans or in the special provisions, a cover crop shall be sown by the same methods required for grass and legume seeding.

d. Rolling. After the seed has been properly covered, the seedbed shall be immediately compacted by means of an approved lawn roller, weighing 40 to 65 pounds per foot (60 to 97 kg per meter) of width for clay soil (or any soil having a tendency to pack), and weighing 150 to 200 pounds per foot (223 to 298 kg per meter) of width for sandy or light soils.

901-3.3 Wet application method.

a. General. The Contractor may elect to apply seed and fertilizer (and lime, if required) by spraying them on the previously prepared seedbed in the form of an aqueous mixture and by using the methods and equipment described herein. The rates of application shall be as specified in the special provisions.

b. Spraying equipment. The spraying equipment shall have a container or water tank equipped with a liquid level gauge calibrated to read in increments not larger than 50 gallons (190 liters) over the entire range of the tank capacity, mounted so as to be visible to the nozzle operator. The container or tank shall also be equipped with a mechanical power-driven agitator capable of keeping all the solids in the mixture in complete suspension at all times until used.

The unit shall also be equipped with a pressure pump capable of delivering 100 gallons (380 liters) per minute at a pressure of 100 lb. / sq inches (690 kPa). The pump shall be mounted in a line that will recirculate the mixture through the tank whenever it is not being sprayed from the nozzle. All pump passages and pipelines shall be capable of providing clearance for 5/8 inch (16 mm) solids. The power unit for the pump and agitator shall have controls mounted so as to be accessible to the nozzle operator. There shall be an indicating pressure gauge connected and mounted immediately at the back of the nozzle.

The nozzle pipe shall be mounted on an elevated supporting stand in such a manner that it can be rotated through 360 degrees horizontally and inclined vertically from at least 20 degrees below to at least 60 degrees above the horizontal. There shall be a quick-acting, three-way control valve connecting the recirculating line to the nozzle pipe and mounted so that the nozzle operator can control and regulate the amount of flow of mixture delivered to the nozzle. At least three different types of nozzles shall be supplied so that mixtures may be properly sprayed over distance varying from 20 to 100 feet (6 to 30 m). One shall be a close-range ribbon nozzle, one a medium-range ribbon nozzle, and one a long-range jet nozzle. For case of removal and cleaning, all nozzles shall be connected to the nozzle pipe by means of quick-release couplings.

In order to reach areas inaccessible to the regular equipment, an extension hose at least 50 feet (15 m) in length shall be provided to which the nozzles may be connected.

c. Mixtures. Lime, if required, shall be applied separately, in the quantity specified, prior to the fertilizing and seeding operations. Not more than 220 pounds (100 kg) of lime shall be added to and mixed with each 100 gallons (380 liters) of water. Seed and fertilizer shall be mixed together in the relative proportions specified, but not more than a total of 220 pounds (100 kg) of these combined solids shall be added to and mixed with each 100 gallons (380 liters) of water.

All water used shall be obtained from fresh water sources and shall be free from injurious chemicals and other toxic substances harmful to plant life. The Contractor shall identify to the RPR all sources of water at least two (2) weeks prior to use. The RPR may take samples of the water at the source or from the tank at any time and have a laboratory test the samples for chemical and saline content. The Contractor shall not use any water from any source that is disapproved by the RPR following such tests.

All mixtures shall be constantly agitated from the time they are mixed until they are finally applied to the seedbed. All such mixtures shall be used within two (2) hours from the time they were mixed or they shall be wasted and disposed of at approved locations.

d. Spraying. Lime, if required, shall be sprayed only upon previously prepared seedbeds. After the applied lime mixture has dried, the lime shall be worked into the top 3 inches (75 mm), after which the seedbed shall again be properly graded and dressed to a smooth finish.

Mixtures of seed and fertilizer shall only be sprayed upon previously prepared seedbeds on which the lime, if required, shall already have been worked in. The mixtures shall be applied by means of a high- pressure spray that shall always be directed upward into the air so that the mixtures will fall to the ground like rain in a uniform spray. Nozzles or sprays shall never be directed toward the ground in such a manner as might produce erosion or runoff.

Particular care shall be exercised to ensure that the application is made uniformly and at the prescribed rate and to guard against misses and overlapped areas. Proper predetermined quantities of the mixture in accordance with specifications shall be used to cover specified sections of known area.

Checks on the rate and uniformity of application may be made by observing the degree of wetting of the ground or by distributing test sheets of paper or pans over the area at intervals and observing the quantity of material deposited thereon.

On surfaces that are to be mulched as indicated by the plans or designated by the RPR, seed and fertilizer applied by the spray method need not be raked into the soil or rolled. However, on surfaces on which mulch is not to be used, the raking and rolling operations will be required after the soil has dried.

901-3.4 Maintenance of seeded areas. The Contractor shall protect seeded areas against traffic or other use by warning signs or barricades, as approved by the RPR. Surfaces gullied or otherwise damaged following seeding shall be repaired by regrading and reseeding as directed. The Contractor shall mow, water as directed, and otherwise maintain seeded areas in a satisfactory condition until final inspection and acceptance of the work.

When either the dry or wet application method outlined above is used for work done out of season, it will be required that the Contractor establish a good stand of grass of uniform color and density to the satisfaction of the RPR. A grass stand shall be considered adequate and the final 1% of retainage will be released, when bare spots are one square foot (0.01 sq m) or less, randomly dispersed, and do not exceed 3% of the area seeded. It is the Contractor's responsibly to water, re-seed, and maintain the site until an acceptable stand of grass has been established.

901-3.6 Temporary Stabilization. The Contractor's attention is directed to C-100 Temporary Air and Water Pollution, Soil Erosion, and Siltation Control for temporary stabilization requirements. It is the Contractor's responsibility to conduct operations in accordance with State Law

METHOD OF MEASUREMENT

901-4.1 The quantity of seeding to be paid for shall be the number of units square yards (sq m) measured on the ground surface, completed and accepted.

BASIS OF PAYMENT

901-5.1 Payment shall be made at the contract unit price per square yards or fraction thereof, which price and payment shall be full compensation for furnishing and placing all material and for all labor, equipment, tools, and incidentals necessary to complete the work prescribed in this item.

Payment will be made under:

Item 901-5.1	Seeding - per square yards

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 Federal Specifications (FED SPEC)

FED SPEC	JJJ-S-181, Federal Specification, Seeds,

Agricultural 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-901

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, by the contractor, 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 shall 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 4 inches (102 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 (1 inches (25 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 obtained on the site shall be measured by the number of cubic yards (cubic meters) of topsoil measured in its original position and stripped or excavated. Topsoil stockpiled by others and removed for topsoil by the Contractor shall be measured by the number of cubic yards (cubic meters) of topsoil measured in the stockpile. Topsoil shall be measured by volume in cubic yards (cubic meters) computed by the method of end areas.

905-4.2 Topsoil obtained off the site shall be measured by the number of cubic yards (cubic meters) of topsoil measured in its original position and stripped or excavated. Topsoil shall be measured by volume in cubic yards (meters) computed by the method of end areas.

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.

905-5.2 Payment will be made at the contract unit price per cubic yard (cubic meter) for topsoil (obtained off 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	Screened Topsoil, From On-Site - per cubic yard

REFERENCES

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

ASTM International (ASTM)

ASTM C117	Materials Finer than 75 □m (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

Item T-908 Mulching

DESCRIPTION

908-1.1 This item shall consist of furnishing, hauling, placing, and securing mulch on surfaces indicated on the plans or designated by the RPR.

MATERIALS

908-2.1 Mulch material. Acceptable mulch shall be the materials listed below or any approved locally available material that is similar to those specified. Mulch shall be free from noxious weeds, mold, and other deleterious materials. Mulch materials, which contain matured seed of species that would volunteer and be detrimental to the proposed overseeding, or to surrounding farmland, will not be acceptable. Straw or other mulch material which is fresh and/or excessively brittle, or which is in such an advanced stage of decomposition as to smother or retard the planted grass, will not be acceptable.

a. Hay. Not Used.

b. Straw. Not Used.

c. Hay mulch containing seed. Not Used.

d. Manufactured mulch**.** Cellulose-fiber or wood-pulp mulch shall be products commercially available for use in spray applications.

e. Asphalt binder. Asphalt binder material shall conform to the requirements of ASTM D977, Type SS-1 or RS-1.

908-2.2 Inspection. The RPR shall be notified of sources and quantities of mulch materials available and the Contractor shall furnish him with representative samples of the materials to be used 30 days before delivery to the project. These samples may be used as standards with the approval of the RPR and any materials brought on the site that do not meet these standards shall be rejected.

CONSTRUCTION METHODS

908-3.1 Mulching. Before spreading mulch, all large clods, stumps, stones, brush, roots, and other foreign material shall be removed from the area to be mulched. Mulch shall be applied immediately after seeding. The spreading of the mulch may be by hand methods, blower, or other mechanical methods, provided a uniform covering is obtained.

Mulch material shall be furnished, hauled, and evenly applied on the area shown on the plans or designated by the RPR. Straw or hay shall be spread over the surface to a uniform thickness at the rate of 2 to 3 tons per acre (1800 - 2700 kg per acre) to provide a loose depth of not less than 1-1/2 inches (38 cm) nor more than 3 inches (75 mm). Other organic material shall be spread at the rate directed by the RPR. Mulch may be blown on the slopes and the use of cutters in the equipment for this purpose will be permitted to the extent that at least 95% of the mulch in place on the slope shall be 6 inches (150 mm) or more in length. When mulches applied by the blowing method are cut, the loose depth in place shall be not less than one inch (25 mm) nor more than 2 inches (50 mm).

908-3.2 Securing mulch. The mulch shall be held in place by light discing, a very thin covering of topsoil, pins, stakes, wire mesh, asphalt binder, or other adhesive material approved by the RPR. Where mulches have been secured by either of the asphalt binder methods, it will not be permissible to walk on the slopes after the binder has been applied. When an application of asphalt binder material is used to secure the mulch, the Contractor must take every precaution to guard against damaging or disfiguring structures or property on or adjacent to the areas worked and will be held responsible for any such damage resulting from the operation.

If the "peg and string" method is used, the mulch shall be secured by the use of stakes or wire pins driven into the ground on 5-foot (1.5-m) centers or less. Binder twine shall be strung between adjacent stakes in straight lines and crisscrossed diagonally over the mulch, after which the stakes shall be firmly driven nearly flush to the ground to draw the twine down tight onto the mulch.

908-3.3 Care and repair.

a. The Contractor shall care for the mulched areas until final acceptance of the project. Care shall consist of providing protection against traffic or other use by placing warning signs, as approved by the RPR, and erecting any barricades that may be shown on the plans before or immediately after mulching has been completed on the designated areas.

b. The Contractor shall be required to repair or replace any mulch that is defective or becomes damaged until the project is finally accepted. When, in the judgment of the RPR, such defects or damages are the result of poor workmanship or failure to meet the requirements of the specifications, the cost of the necessary repairs or replacement shall be borne by the Contractor.

c. If the "asphalt spray" method is used, all mulched surfaces shall be sprayed with asphalt binder material so that the surface has a uniform appearance. The binder shall be uniformly applied to the mulch at the rate of approximately 8 gallons (32 liters) per 1,000 square feet (100 sq m), or as directed by the RPR, with a minimum of 6 gallons (24 liters) and a maximum of 10 gallons (40 liters) per 1,000 square feet (100 sq m) depending on the type of mulch and the effectiveness of the binder securing it. Asphalt binder material may be sprayed on the mulched slope areas from either the top or the bottom of the slope. An approved spray nozzle shall be used. The nozzle shall be operated at a distance of not less than 4 feet (1.2 m) from the surface of the mulch and uniform distribution of the asphalt material shall be required. A pump or an air compressor of adequate capacity shall be used to ensure uniform distribution of the asphalt material.

d. If the "asphalt mix" method is used, the mulch shall be applied by blowing, and the asphalt binder material shall be sprayed into the mulch as it leaves the blower. The binder shall be uniformly applied to the mulch at the rate of approximately 8 gallons (32 liters) per 1,000 square feet (100 sq m) or as directed by the RPR, with a minimum of 6 gallons (24 liters) and a maximum of 10 gallons (40 liters) per 1,000 square feet (100 sq m) depending on the type of mulch and the effectiveness of the binder securing it.

METHOD OF MEASUREMENT

908-4.1 Mulching shall be measured in square yards (square meters) on the basis of the actual surface area acceptably mulched.

BASIS OF PAYMENT

908-5.1 Payment will be made at the contract unit price per square yard (square meter) for mulching. The price shall be full compensation for furnishing all materials and for placing and anchoring the materials, and for all labor, equipment, tools, and incidentals necessary to complete the item.

Payment will be made under:

Item T-908-5.1	Mulching - per square yard

REFERENCES

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

ASTM International (ASTM)

ASTM D977	Standard Specification for Emulsified

Asphalt 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-908

Item X-106 Safety, Security and Permitting

DESCRIPTION

106-1 Any condition, provision, requirement, or technical specification prepared or specified by the local government or consulting Architect/Engineer, as listed below and appended to the proposal documents or as may be included on the plans, is made a part of this contract.

106-2 Safety and Security. Safety and Security shall include direct costs to the Contractor involving safety of aircraft, on site surface transportation, and the general public, which costs are not directly attributable to, or specified as incidental to, other contract pay items. This item shall include, but is not limited to, furnishing, installing, maintaining, moving and removing of all necessary temporary signs, flags, barricades, lights, and devices, to protect air traffic in active air operations areas, and affected pedestrians and surface transportation in contract areas; operations and vehicle identification devices on controlled airports; providing security of Contractor's areas and openings in boundaries of airports; and other similar costs. Safety & Security shall be limited to 7.5% of the total project costs.

METHOD OF MEASUREMENT

106-4.1 Based upon the contract lump sum price for "Safety and Security", partial payments will be allowed as follows:

a. When 5% or more of the original contract is earned, 15%.

b. When 15% or more of the original contract is earned, an additional 5%.

c. When 25% or more of the original contract is earned, an additional 5%.

d. When 50% or more of the original contract is earned, an additional 25%.

e. When 75% or more of the original contract is earned, an additional 25%.

f. After Final Inspection, Staging area clean-up and delivery of all Project Closeout materials as required by 90-11, the final 25%.

106-4.2 The Contractor will be reimbursed at the actual per dollar cost of permit fees, not to include refundable deposits and bonds, required for completion of the project as determined by the Contractor and submitted to the RPR.

BASIS OF PAYMENT

106-5 Payment will be made under:

Item X-106-5.1	Safety and Security,7.5% Max., per lump sum

END OF ITEM X-106

Item X-701 Pipe Cleaning and Televising

1. Description

Work under this item shall include cleaning and televising of those sections of storm sewer and underdrain as indicated in the plans. Cleaning operations shall remove foreign materials from the lines (if found). Upon completion of cleaning services, all storm sewer sections shall be televised for final acceptance by the Engineer.

2. Materials

a. Cleaning equipment shall be capable of removing dirt, grease, rocks, sand, other materials, obstructions and cutting hanging gaskets and/or roots from the sewer lines and manholes. If cleaning of an entire section cannot be successfully performed from one manhole, the equipment shall be established in alternative manholes and cleaning again attempted. If, again, successful cleaning cannot be performed or the equipment fails to traverse the entire manhole section, it will be assumed that a major blockage exists and the cleaning effort shall be abandoned.

b. The television camera used for the inspection shall be one specifically designed and constructed for such inspection. The camera shall be capable of radial view for inspection of the top, bottom, and sides of pipe and for looking up lateral connections. The camera shall be mounted on adjustable skids, or self-propelled, to keep it in the center of the pipe. Lighting of the camera shall be supplied by a lamp on the camera, capable of being dimmed or brightened remotely from the control panel. The lighting system shall be capable of lighting the entire periphery of the pipe. The camera shall be operative in 100% humidity conditions and shall have a minimum of 650 lines of resolution and tested at 400 psi. The view seen by the televising camera shall be transmitted to a monitor of not less that 17 inches. The camera, television monitor, and other components of the video system shall be capable of producing a picture quality satisfactory to the Engineer.

c. The location meter, for accurately recording the location of the television camera with respect to the reference manhole, shall be a direct reading, above ground, friction clamp device or other suitable equipment. The meter shall be capable of reducing readings for reverse movement of the camera and shall be capable of being manually re-zeroed for each new setup. Footage shall be shown on the video data view and recorded at all times.

3. Construction Methods

a. Cleaning

i. Site Conditions: If pre-existing conditions such as broken pipe and major blockages prohibit cleaning without further damage to the pipe, the Contractor

shall not clean those specific sections and shall notify the RPR immediately.

ii. Small Pipes: In those cases where pipe diameters are less than 12 inches, the Contractor shall not be required to televise pipe designated for cleaning, if equipment size does not allow. Acceptance of cleaning shall be determined by amount of material flushed to the downstream manhole. In the event that the material flushed through a small pipe segment is not immediately visible, the Contractor and Engineer shall predetermine an appropriate flushing time based upon the segment length and pipe diameter.

iii. Pipe Repair: Any damage caused by cleaning operations in those sections designated for cleaning shall be repaired immediately at the expense of the Contractor.

iv. Gasket Trimming / Root Removal: In the event that a hanging pipe gasket is found, the obstruction shall be carefully trimmed. Roots shall be removed in the sections where root intrusion is a problem. Any work done to trim a gasket or remove roots in a section shall be documented in the report. Documentation shall include the locations in the pipe segment where the obstruction was encountered and the procedure which was used to remove the obstruction.

v. Material Removal: All sludge, dirt, sand, rock, grease, and other solid or semisolid material resulting from the cleaning operation shall be removed at the downstream manhole of the section being cleaned. Passing material from manhole section to manhole section, which could cause line stoppages, accumulations of sand in wet wells, or damage pumping equipment, shall not be permitted. A vacuum truck shall be used to remove accumulations of material.

vi. Disposal of Materials: All solids or semi-solids resulting from the cleaning operations shall be removed from the site and disposed of at the Contractor's expense. Under no circumstances will the Contractor be allowed to stockpile material designated for disposal onsite.

vii. Water Use: The Contractor shall furnish water for all cleaning and flushing operations. The contractor shall also coordinate with the Airport and designate those specific hydrants that are available for use prior to cleaning. The Contractor shall pay all costs associated with the use and transportation of this water.

viii. Final Acceptance: Acceptance of sewer line cleaning shall be based on inspection at manholes and viewing of televising following cleaning.

ix. If cleaning is not found acceptable, the contractor shall re-clean and re-televise the unacceptable segment at no expense to the owner.

b. Televising:

i. Execution: The television camera shall be moved through the line in either direction at a uniform rate, stopping when necessary to ensure proper documentation of the sewer's condition but in no case will the television camera be pulled at a speed greater than 30 feet per minute. Manual winches, power

winches, TV cable, and powered rewinds shall not obstruct the camera view. If, during the inspection operation the television camera cannot pass through the entire sewer section, the Contractor shall reestablish the televising equipment from an alternative manhole. If, again, the camera cannot pass through the entire sewer section, the inspection shall be considered complete and no additional inspection work will be required. If the camera becomes submerged due to a sag in the pipe, a high velocity jet will be utilized to pull water away from the camera lens.

ii. Television Inspection Logs: The logs shall be typed or computer printed and acceptable to the Owner.
   (1) Location Information: Locations shall be record in relation to adjacent manholes, for: each infiltration point discovered by the television camera; an estimate of the flow rate of observed infiltration points shall be made and recorded; other points of significance such as locations of laterals, joints, unusual conditions, roots, other storm sewer connections, collapsed sections, presence of scale and corrosion, and other discernible features.
   (2) Other Data: Logs shall also include date, time, sewer section, reference manhole number, name of operator, inspector, and weather conditions; pipe diameter, pipe material, section length, depth of pipe, length between joints, and corresponding videotape identification; and any deflection in alignment of grade of pipe.
   (3) Copies: Two (2) copies of such inspection logs shall be supplied to the Owner.

iii. Digital Recordings: The purpose of digital recording shall be to supply a visual and audio record of the condition of the lines that may be replayed. Video tape recording playback shall be at the same speed that it was recorded. Upon completion of the work, all video tapes recorded during the television inspection shall become the property of the Owner. Cost of video tapes shall be included in the unit price bid. A complete recording shall be made of each line televised. A voice recording on video tapes shall make brief and informative comments on the sewer conditions.

4. Method of Measurement

Measurement for acceptable storm sewer cleaning and televising segments shall be determined along the storm sewer alignment, in complete straight-line segments, from center of manhole to center of manhole. No additional measurement shall be made for those sections where obstruction or blockage prohibits cleaning of the entire pipe segment, or in those circumstances where additional cleaning is required for final acceptance. Markings on the cable, or the like, which would require interpolation for depth of manhole, will not be allowed. No separate measurement shall be made for cleaning of manholes.

5. Basis of Payment

Payment shall be made at the contract unit price per linear foot for storm sewer cleaned and televised by the Contractor and accepted by the Engineer. The cost of cleaning manholes and for re-setup due to an obstruction in the sewer that will not allow the camera to pass shall be considered incidental to storm

sewer cleaning. The price for this work shall be full compensation for all storm sewer cleaning, manhole cleaning, televising, water, disposal, materials, labor, equipment, tools, and other incidentals necessary to complete this item of work.

Payment will be made under:

Item X-701-5.1	Storm Sewer Cleaning 12 to 30 inch, per linear foot
Item X-701-5.2	Underdrain Cleaning, 6-8 inch, per linear foot

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Part 6

Wage Rates

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"General Decision Number: ME20260047 01/23/2026

Superseded General Decision Number: ME20250047

State: Maine

Construction Type: Highway

County: Penobscot County in Maine.

HIGHWAY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/02/2026
1	01/23/2026

ENGI0004-004 04/01/2025

	Rates	Fringes
POWER EQUIPMENT OPERATOR: Grader/Blade, Mechanic, Paver (Asphalt, Aggregate, and Concrete), Roller Asphalt	$ 30.17	13.80

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* TEAM0340-003 12/01/2025

	Rates	Fringes
TRUCK DRIVER (Vacuum Truck)	$ 25.65	17.69

SUME2014-042 06/23/2017

	Rates	Fringes
CARPENTER, Includes Form Work	$ 18.95	3.23
CEMENT MASON/CONCRETE FINISHER	$ 19.27	1.13
ELECTRICIAN	$ 25.78	6.83
IRONWORKER, REINFORCING	$ 21.85	0.00
IRONWORKER, STRUCTURAL	$ 22.33	4.50
LABORER: Asphalt, Includes Raker, Shoveler, Spreader and Distributor	$ 17.08	2.48
LABORER: Common or General	$ 12.83	2.20
LABORER: Landscape	$ 17.03	2.81

OPERATOR: Backhoe/Excavator/Trackhoe	$ 16.33	2.78
OPERATOR: Bobcat/Skid Steer/Skid Loader	$ 19.26	5.57
OPERATOR: Broom/Sweeper	$ 18.77	0.00
OPERATOR: Bulldozer	$ 21.71	5.67
OPERATOR: Loader	$ 18.94	7.66
OPERATOR: Milling Machine	$ 26.83	7.05
OPERATOR: Roller (Earth)	$ 17.61	2.97
TRAFFIC CONTROL: Flagger	$ 9.00	0.00
TRAFFIC CONTROL: Laborer-Cones/ Barricades/Barrels - Setter/Mover/Sweeper	$ 17.02	5.37
TRUCK DRIVER: Dump Truck	$ 14.56	6.32

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Note: Executive Order 13658 generally applies to contracts subject to the Davis-Bacon Act that were awarded on or between January 1, 2015 and January 29, 2022, and that have not been renewed or extended on or after January 30, 2022. Executive

Order 13658 does not apply to contracts subject only to the Davis-Bacon Related Acts regardless of when they were awarded. If a contract is subject to Executive Order 13658, the contractor must pay all covered workers at least $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025. The applicable Executive Order minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under Executive Order 13658 is available at www.dol.gov/whd/govcontracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE:

UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor

200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION"

APPENDIX 1

CONSTRUCTION SAFETY AND PHASING PLAN

CONSTRUCTION SAFETY PHASING PLAN

FOR THE

REHABILITATION AND RECONSTRUCTION OF TAXIWAY A AND M

AT

BANGOR INTERNATIONAL AIRPORT

BANGOR, MAINE

PREPARED FOR: BANGOR INTERNATIONAL AIRPORT

PREPARED BY: MEAD & HUNT
75 WASHINGTON AVE, SUITE 202
PORTLAND, ME 04101

MARCH 2026

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INTRODUCTION

This Construction Safety and Phasing Plan (CSPP) provides the airport, contractors, and consultants with a safety plan for the Rehabilitation and Reconstruction of Taxiway A & M (PROJECT) at Bangor International Airport (BGR) and serves as a supplemental contract document to the plans and specifications for this Project. This CSPP has been written in accordance with Federal Aviation Administration (FAA) Advisory Circular (AC) 150/5370-2G *Operational Safety on Airports during Construction*.

The Bangor International Airport (BGR) is owned and operated by the City of Bangor, Maine. When the term "Airport Operator" or "Airport" or "BGR" is used herein it shall be understood to mean the Bangor International Airport.

PROJECT DESCRIPTION

This project includes the rehabilitation and reconstruction of Taxiway A in designated areas and the rehabilitation of the entire Taxiway M. The rehabilitation will include removal of existing Asphalt Concrete (AC), asphalt pavement milling, new pavement construction with paved shoulder, markings, cleaning of storm drain infrastructure, underdrain system, grading and erosion and sediment control, taxiway existing guidance sign demolition, and installation and adjustments of taxiway edge lights. The reconstruction will also include the rubblization of underlying Portland Cement Concrete (PCC) surfaces.

Upon successful award of this project the Contractor will be required to submit a "Safety Plan Compliance Document" (SPCD). Within the content of the SPCD, the Contractor will include a statement that they have read and understand the CSPP and how they will comply with all the requirements and safety procedures detailed within it. Any information not discussed in the original CSPP or ANY changes to the constructability of the project MUST be outlined in the SPCD and submitted to the airport and FAA for review. The SPCD must be submitted to and approved by the airport prior to the Notice-to-Proceed (NTP) date for physical construction of the project.

The phasing development for this project took into consideration the need to minimize impacts that the project will have on airport operations while progressing the work in a timely fashion and logical sequence of construction activities. The CSPP will be revised as needed throughout the project. The CSPP and SPCD will be always available on the jobsite. It is the responsibility of the Contractor to ensure all construction personnel are familiar with the safety procedures and regulations of the airport.

In the event the Contractor's activities are found to be in non-compliance with the requirements of the CSPP or SPCD, the airport's representatives will direct the Contractor in writing to immediately stop all operations of that particular work until such a time that all deficiencies are mitigated and/or corrected to the satisfaction of the airport.

The following sections of this CSPP will address scheduling, coordination, and airfield safety precautions as they relate to the Project. The following construction safety phasing plan sheets (Drawings) provided with the Contract Plans that supplement the following sections in meeting the requirements of FAA AC 150/5370-2G include:

- G-081 Construction and Safety Phasing Plan Layout

- G-082 Phase 1
- G-083 Phase 2
- G-084 Phase 3
- G-085 Construction Safety and Phasing Details

1. COORDINATION

a. As the party responsible for airport safety, Bangor International Airport has established, and will enforce, this CSPP. The Contractor to whom the Contract is awarded is, as a condition of the Contract, are required to agree to comply with the provisions of this CSPP and execute a Safety Plan Compliance Document (SPCD) acceptable to Bangor International Airport. The Contractor shall incorporate into the SPCD details of how he will comply with the CSPP along with any supplemental information that could not be included in this CSPP prior to the contract award. The supplemental information in the SPCD must be written to match the format of this CSPP indicating each subject by corresponding CSPP subject number and title. Coordination of the project will begin with the Pre-construction Conference that will be scheduled as soon as practicable after the award of a Contract, but prior to the Notice-To-Proceed to the Contractor. The conference will be conducted as required by FAA AC 150/5370-2G. The following will be invited:

A. Authority Engineer and appropriate staff
B. Design Engineer
C. Resident Engineer
D. Airport Operations
E. Testing laboratory representative
F. Contractor and subcontractor(s)
G. Contractor's project superintendent
H. Contractor's project clerk
I. Airport users, including fixed base operators and on-airport tenants
J. Federal, state, or local agencies affected by the proposed construction
K. Representative of FAA Airports regional or field office
L. Representative of the Air Traffic Control (ATC) Tower.

b. Other Coordination

1) Design Coordination
During the design process coordination meetings were held with the State of Maine Air National Guard and the FAA Air Traffic Control Tower. These meetings were held to understand the needs of these important stakeholders needs during the construction project.

2) Contractor Progress Meetings
During Construction, weekly Progress Meetings will be held. This CSPP will be an agenda item for all meetings. Plan compliance issues will be discussed and resolved at each meeting.

3) Scope or Schedule Changes

Changes in the Scope of Work or the schedule will be submitted to BGR for review and approval and coordinated with the affected parties prior to being incorporated into the project CSPP revisions.

4) FAA ATO Coordination
Airport Operations staff will coordinate with Air Traffic Operations with respect to phasing.

c. Before beginning any construction activity, the Contractor must be aware of and understand the safety requirements and hazards described in the FAA AC 150/5370-2G. A copy of the FAA AC and CSPP is incorporated within the project Contract Specifications and will be reviewed at a pre-construction meeting prior to the start of any work.

d. Construction activities shall be coordinated with the airport operator and with airport airside tenants. The Engineer shall be notified of any change in plan and will update the airport operator. All coordination will be at the airport operator's directive. Only the airport operator can open or close runways or taxiways.

e. A list of responsible representatives/points of contact for all parties involved and procedures for contacting each of them, including after hours, is included in Appendix 2.

2. PHASING

a. The Contractor shall complete all work associated with this project within the durations given in the Contract Documents. The work is divided into multiple phases as shown in the construction and safety phasing plans.

b. The phasing plans were developed to minimize the disruption to airfield operations while still allowing the Contractor to perform his work in the most efficient manner possible. Deviations from the phasing plans will not be allowed unless prior approval is received from the Engineer. Work areas are subject to change based on weather and/or operations and the Contractor shall be prepared to revise any proposed work plans based on weekly coordination and any unforeseen circumstances encountered during construction activities.

c. All contractor operations on the airfield within the Air Operations Area (AOA) shall require radio escorts, employed by the Contractor, and approved and trained by Airport Operations, when crossing or working in movement areas.

d. The Contractor shall minimize the amount of equipment and materials within the object free areas of active taxiways and runways to the greatest extent possible. The Contractor may be ordered by Airport Operations to evacuate all men and equipment off the airfield immediately in the case of an emergency. The Contractor may also be asked to move men and equipment to allow for safe passage of an aircraft, weather related conditions, or operational need that can't otherwise be accommodated.

e. Phasing notes and details have been included within the Contract Plans. The Contractor shall be familiar with the regulations and requirements contained within.

f. The work will be accomplished by three (3) work areas as shown in the CSPP Drawings. The proposed construction is within the Air Operations Area (AOA) and is to be completed in several phases as depicted on the Construction Safety Phasing Plan Drawing in Appendix A of this CSPP. The Construction Safety Phasing Plan Drawing identifies the phase elements for each phase including:

- Contractor work areas and description of work being performed
- Affected AOA, ARFF access routes, NAVAIDs
- Work hours available
- Duration
- Lighting, marking, and signage changes
- Required hazard marking, lighting, and signage
- Lead times for required notifications

The Contractor shall meet with Bangor International Airport Operations at the security gate at the beginning of each shift. At this time, the Contractor will be instructed as to which access/restriction scenario (option) will be enforced for the given day. Traffic patterns may change during the day and may include the switching of the runway landing ends or the change from VFR to IFR conditions or vice versa. Airport Operations will notify the Engineer and Contractor of changes in access restrictions and allowable access routes prior to the change. Refer to the Project Contract Documents and CSPP Drawings for details on contractor work areas, staging areas, haul routes, and construction requirements. These sheets further contain notes which reinforce safety concerns and access restrictions for this project. The following notations for each phase is a description of major work items (1); location of work, airfield impacts, and working hours (2); description of work limitations and restrictions and access gates (3); and limitations and options on access to the site with regards to aircraft traffic flow and VFR/IFR conditions (4).

G-082 Phase 1a

1) Major work items include the mill and overlay of full-strength pavement on Taxiway A, rubblize existing PCC pavement.

2) Taxiway A closed from STA 60+58 to 70+00 (NW end of joint use apron).
   a. Closure shall be coordinated through RPR, with the airport a minimum of 2 weeks prior to start.
   b. Airfield Impacts.
      - Aircraft leaving the joint use, heavy duty and terminal apron that wish to depart Runway 15 will be required to enter the Runway at Taxiway K and back taxi on the Runway. See red marking in *Figure 1*.
      - MEANG aircraft leaving the Whiskey Apron wishing to depart the 33 end will be required to enter the runway at Taxiway M and back taxi on the runway. See cyan marking in *Figure 1*.

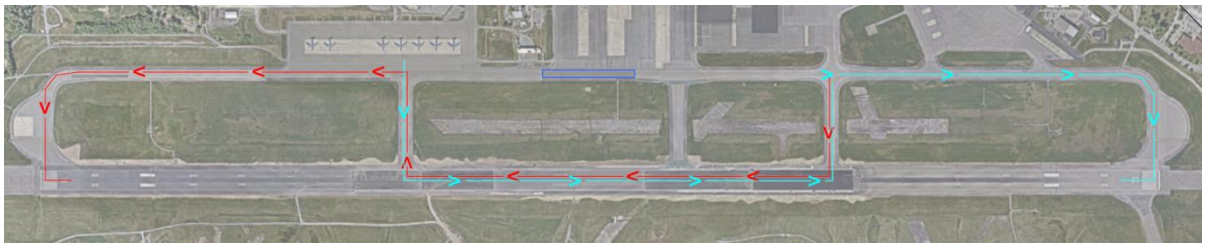


Figure 1: Airfield Impacts, Phase 1a Departures

- Aircraft landing 33 and wishing to park on the joint use, heavy duty and terminal apron will be required to utilize Taxiway M to back taxi on the runway to Taxiway K. See pink marking in *Figure* 2.
- MEANG aircraft landing 15 and wishing to park on Whiskey Apron will be required to enter the runway at Taxiway K and back taxi on the runway to Taxiway M. See green marking in *Figure* 2.



Figure 2: Airfield Impacts, Phase 1a Arrivals

c. Working hours. 6am to 7pm Mon-Sat

3) Work area to be accessed via gate 36 then travel around the edge of the joint use apron. Non AOA trained drivers will be escorted from Gate 36 to the work area by a trained driver.

4) Limitations and options on access to the site with regards to aircraft traffic flow
   a. Aircraft departing the joint use apron and heavy duty apron will be entering Taxiway A to the east of Phase 1A work zone. The barricades will be placed 108' from the taxilane centerline so that the work zone is outside of the TSA (TSA - ADG V 214').

G-082 Phase 1b

1) Major work items include mill and overlay pavement on Taxiway A, rubblizing existing PCC pavement. Construct bituminous pavement and 30' wide bituminous asphalt shoulder pavement along the Taxiway. Removal of shoulder pavement exceeding width of 30' and pavement leading to closed Taxiway L. Adjustment and installation of taxiway edge lights.

2) Taxiway A closed from STA 70+00 to 87+79.
   a. Closure shall be coordinated through RPR, with the airport a minimum of 2 weeks prior to start.
   b. Taxiway A closed from the SE side of the joint use apron to the NW edge of the intersection of Taxiway A and Taxiway K.
   c. Airfield Impacts.

- Aircraft on the Joint Use, Heavy Duty and MEANG Whiskey apron that wish to depart Runway 33 will be required to enter the Runway at Taxiway M and back taxi on the Runway to Taxiway K. See red marking in *Figure 3*.
- Aircraft on the Terminal Apron and the GA Apron wishing to depart 15, will be required to enter the Runway at Taxiway K and back taxi on the runway to taxiway M. See cyan marking in *Figure 3*.

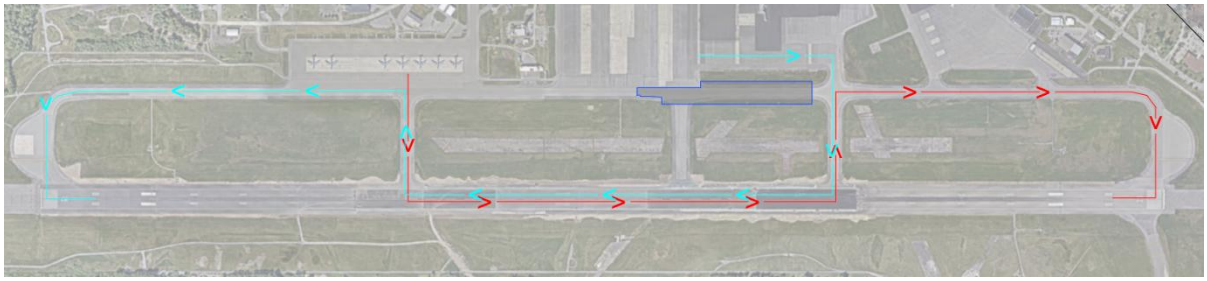


Figure 3: Airfield Impacts, Phase 1b Departures

- Aircraft landing 15 and wishing to park at the Joint Use, Heavy Duty and MEANG Whiskey aprons will be required to enter the runway at Taxiway K and back taxi on the runway to Taxiway M. See pink marking in *Figure 4*.
- Aircraft landing 33 and wishing to park on the Terminal apron and the GA apron will be required to depart the runway at the 15 end and enter the runway at Taxiway M and back taxi on the runway to Taxiway K. See green marking in *Figure 4*.

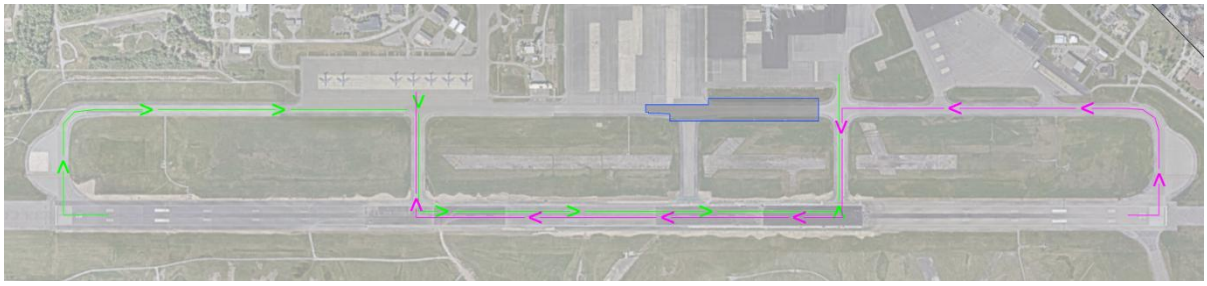


Figure 4: Airfield Impacts, Phase 1b Arrivals

d. Working hours. 6am to 7pm Mon-Sat

3) Work area to be accessed via gate 36 then traveling along the edge of the joint use apron then back across the entrance to the apron or directly across the joint use apron. Non AOA trained drivers will be escorted from Gate 36 to the work area by a trained driver.

4) Limitations and options on access to the site with regard to aircraft traffic flow.
   a. Construction vehicles will need to yield to all aircraft when crossing the active portion of the joint use and heavy duty apron.

G-082 Phase 1c

1) This work is the Intersection of Taxiway A and K, a crucial taxiway intersection at the airport. Work in this phase will require the most back taxiing on the runway, therefore it has been broken out as a small work area to expedite the work. Major work items include mill and overlay pavement on Taxiway A & K

intersection, rubblize existing PCC pavement. 30' wide bituminous asphalt shoulder pavement along Taxiway A & M intersection. Removal of shoulder pavement exceeding 30' shoulder width.

2) Taxiway A closed from STA 87+79 to 92+17.
    a. Closure shall be coordinated through RPR, with the airport a minimum of 2 weeks prior to start.
    b. Taxiway A and Taxiway K closed through the intersection of Taxiway A and Taxiway K.
    c. Airfield Impacts.
        - Aircraft on the Joint Use, Heavy Duty and MEANG Whiskey apron that wish to depart from Runway 33 will be required to enter the Runway at Taxiway M and back taxi on the Runway to the turn pad at the south end of Taxiway. See red marking in *Figure 5*.
        - Aircraft on the Terminal Apron and the GA apron wishing to depart 15, will be required to taxi across the terminal apron to access Taxiway A heading west. See cyan marking in *Figure 5*.
        - Aircraft on the Terminal Apron and the GA Apron wishing to depart from 33, will be required to taxi across the terminal apron to access Taxiway A heading west and then enter the runway at Taxiway M before back taxiing on the runway to the turn pad at the 33 End. See pink marking in *Figure 5*.

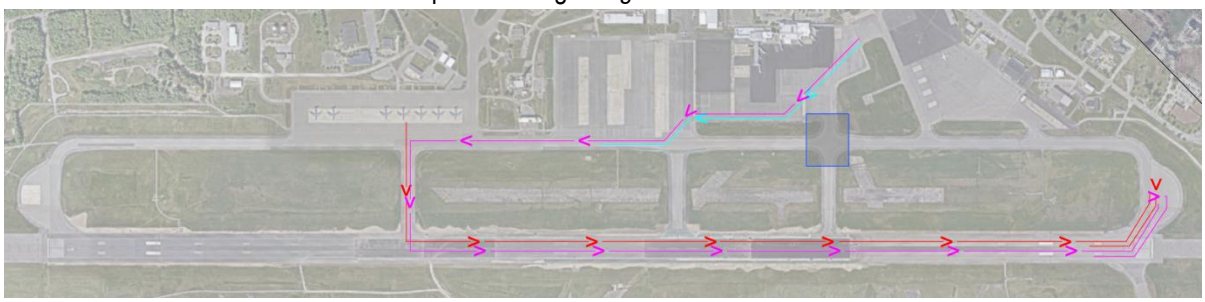


Figure 5: Airfield Impacts, Phase 1c Departures

- Aircraft landing 15 and wishing to park at the Terminal Apron, GA Apron, Joint Use, Heavy Duty and MEANG Whiskey aprons will be required to utilize the turn pad at the 33 end and back taxiway on the runway to Taxiway M. See green marking in *Figure 6*.
- Aircraft landing 33 and wishing to park on the Terminal apron and the GA apron will l be required to taxi across the terminal apron. See yellow marking in *Figure 6*.

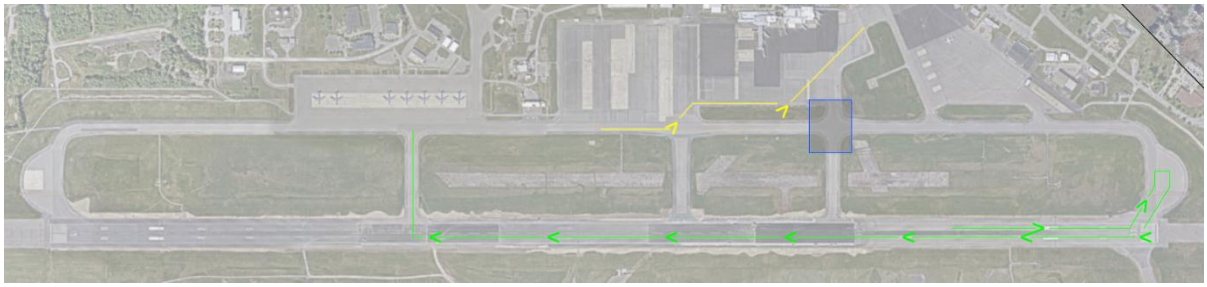


Figure 6: Airfield Impacts, Phase 1c Arrivals

    d. Working hours. 6am to 7pm Mon-Sat

3) Work area to be accessed via Gate 11 across the GA apron, from here a temporary service road will be constructed across the northern section of the grass island separating the GA apron from the Terminal Apron, then access will continue traveling along the Terminal Apron shoulder to the work site. Non AOA trained drivers will be escorted from Gate 36 to the work area by a trained driver.

4) Limitations and options on access to the site with regard to aircraft traffic flow.
    a. Construction vehicles will need to yield to all aircraft when crossing the GA apron and when using the shoulder of the terminal apron.

G-083 Phase 2

1) Major work items include mill and overlay pavement on Taxiway A, rubblize existing PCC pavement. And pave levelling and surface courses and 30' wide bituminous asphalt shoulder pavement along Taxiway A including the installation of underdrain. Removal of shoulder pavement exceeding 30' shoulder width. Replace portions of the existing underdrain system.

2) Taxiway A closed from STA 8+54 to 45+03.
    a. Closure shall be coordinated through RPR, with the airport a minimum of 2 weeks prior to start.
    b. Taxiway A closed from the NW end of the taxiway to the NW edge of the intersection of Taxiway A and Taxiway M.
    c. Airfield Impacts.
        - Aircraft wishing to depart from runway 15 will need to enter the runway at Taxiway M and back taxi to the 15 end turn pad. See red marking in *Figure 7*.

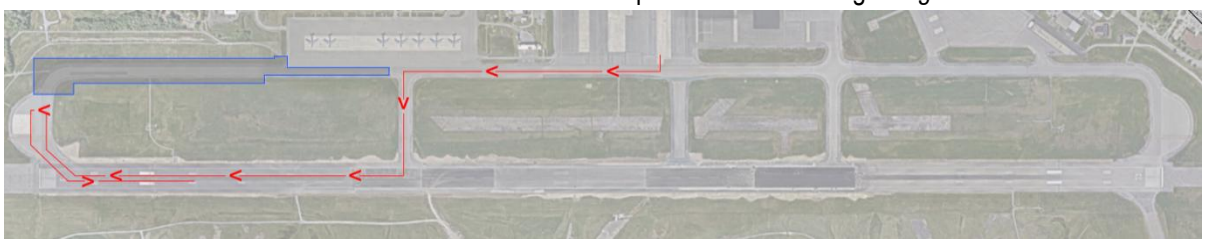


Figure 7: Airfield Impacts, Phase 2 Departures

- Aircraft landing 33 who cannot depart from the runway at Taxiway M will need to utilize the 15 turn pad and back taxi on the runway to Taxiway M. See pink marking in *Figure 8*.
- The ME ANG will not be able to utilize their 5 western parking spaces on Whiskey Apron. Coordination has been undertaken for them to use the joint use apron during this time if required. See purple marking in *Figure 8*.



Figure 8: Airfield Impacts, Phase 2 Arrivals

d. Working hours. 6am to 7pm Mon-Sat

3) Work area to be accessed via gate 24 and then airport perimeter road around the Runway 15 approach.

4) Limitations and options on access to the site with regards to aircraft traffic flow and VFR/IFR conditions.
   a. There is an airfield perimeter road that runs within 150' of the 33 localizer array. Even though this road is outside the localizer critical area as shown on the master plan FAA tech ops still feel uncertain if these construction vehicles will impact the localizer signal. Further coordination with tech ops is required, for now the longer route on the service road avoiding the localizer has been shown on the phasing plans with a note indicating coordination with the RPR and tech ops is required before utilizing the road near to the ILS array.
   b. The Phase 2 work zone is outside of the glide slope critical area for Runway 15 approach. However, it is beyond the ILS hold line. Ongoing coordination with FAA tech ops regarding the size and number of equipment the Contractor will utilize in this area will occur to determine if this may impact the glide slope signal.

G-084 Phase 3a

1) This work is on taxiway M inside the Taxiway A object free area. This work will occur at night to minimize disruption to the airport. Major work items include mill and overlay pavement on Taxiway M full strength pavement and shoulders, adjustment of existing taxiway edge lights and removal of shoulder pavement exceeding 30' shoulder width.

2) Taxiway M closed. Taxiway A west of Taxiway M will also be closed.
   a. Closure shall be coordinated through RPR, with the airport a minimum of 2 weeks prior to start.
      - Airfield Impacts. Taxiway M will be closed. Taxiway A west of taxiway M will be closed.
      - Aircraft wishing to depart from runway 15 will need to enter the runway at Taxiway K and back taxi to the 15 end turn pad. See red marking in *Figure 9*.

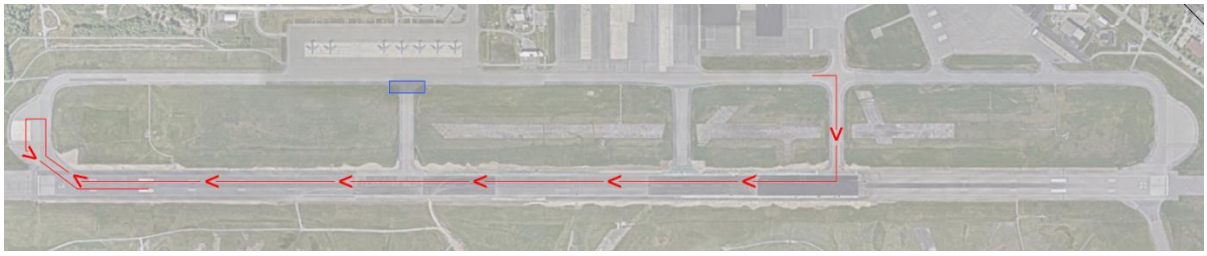


Figure 9: Airfield Impacts, Phase 3a Departures

- Aircraft landing 33 who cannot depart from the runway at Taxiway K will need to utilize the 15 turn pad and back taxi on the runway to Taxiway M. See pink marking in *Figure 10*.
- The ME ANG will not be able to utilize their 5 western parking spaces on Whiskey Apron. Coordination has been undertaken for them to use the joint use apron during this time if required. See purple marking in *Figure 10*.

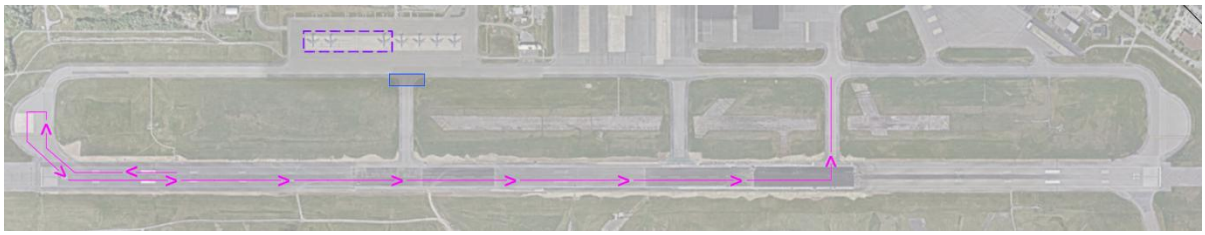


Figure 10: Airfield Impacts, Phase 3a Arrivals

b. Working hours. 12am-5am Mon-Sat

3) Work area to be accessed via perimeter service roads around the 15 end of the runway. Then via a service road parallel to Taxiway A to the edge of the whiskey apron, then across Taxiway A to the work zone.

4) Limitations and options on access to the site with regards to aircraft traffic flow and VFR/IFR conditions.
   a. There is an airfield perimeter road that runs within 150' of the 33 localizer array. Even though this road is outside the localizer critical area as shown on the master plan FAA tech ops still feel uncertain if these construction vehicles will impact the localizer signal. Further coordination with tech ops is required, for now the longer route on the service road avoiding the localizer has been shown on the phasing plans with a note indicating coordination with the RPR and tech ops is required before utilizing the road near to the ILS array.

G-084 Phase 3b

1) This work is on Taxiway M outside of the ROFA for Runway 15-33 and the TOFA for Taxiway A. Major work items include mill and overlay pavement on Taxiway M full strength pavement and shoulders, adjustment of existing taxiway edge lights and removal of shoulder pavement exceeding 30' shoulder width.

2) Taxiway M closed.
   a. Closure shall be coordinated through RPR, with the airport a minimum of 2 weeks prior to start.
   b. Airfield Impacts. Taxiway M closed to traffic. No other impacts.
   c. Working hours. 6am to 7pm Mon-Sat

3) Work area to be accessed via perimeter service roads on the NW end of the taxiway and the perimeter service road by the whiskey apron.

4) Limitations and options on access to the site with regards to aircraft traffic flow and VFR/IFR conditions.
   a. There is an airfield perimeter road that runs within 150' of the 33 localizer array. Even though this road is outside the localizer critical area as shown on the master plan FAA tech ops still feel uncertain if these construction vehicles will impact the localizer signal. Further coordination with tech ops is required, for now the longer route on the service road avoiding the localizer has been shown on the phasing plans with a note indicating coordination with the RPR and tech ops is required before utilizing the road near to the ILS array.

G-084 Phase 3c

1) This work is on Taxiway M inside the ROFA for Runway 15-33. Major work items include mill and overlay pavement on Taxiway M full strength pavement and shoulders, adjustment of existing taxiway edge lights and removal of shoulder pavement exceeding 30' shoulder width.

2) Runway 15-33 and Taxiway M closed.
    a. Closure shall be coordinated through RPR, with the airport a minimum of 2 weeks prior to start.
    b. Airfield Impacts. Runway closed.
    c. Working hours. 12am to 5am Mon-Sat
3) Work area to be accessed via perimeter service roads around the 15 end of the runway. Then via a service road parallel to Taxiway A to the edge of the whiskey apron, then across Taxiway A to the work zone.

4) Limitations and options on access to the site with regards to aircraft traffic flow and VFR/IFR conditions.
    a. There is an airfield perimeter road that runs within 150' of the 33 localizer array. Even though this road is outside the localizer critical area as shown on the master plan FAA tech ops still feel uncertain if these construction vehicles will impact the localizer signal. Further coordination with tech ops is required, for now the longer route on the service road avoiding the localizer has been shown on the phasing plans with a note indicating coordination with the RPR and tech ops is required before utilizing the road near to the ILS array.

3. AREAS AND OPERATIONS AFFECTED BY CONSTRUCTION ACTIVITY

a. The following are the planned impacts to airport operations.

Phase 1a: Taxiway A closed from the western edge of the joint use apron to the start of the intersection between Taxiway A and closed Taxiway L.

Phase 1b: Taxiway A closed from the east side of the joint use apron to the west edge of the intersection of Taxiway A and Taxiway K.

Phase 1c: Taxiway A and Taxiway K closed at the intersection of Taxiway A and Taxiway K.

Phase 2: Taxiway A closed from the ILS hold line to the western edge of the intersection of Taxiway A and Taxiway M.

Phase 3a: Taxiway M closed. Taxiway A west of Taxiway M will also be closed.

Phase 3b: Taxiway M closed.

Phase 3c: Taxiway M and Runway 15-33 closed.

b. When long-term taxiway closure is required, the contractor shall turn off lighting, cover airfield signs, remove markings, cover edge lights, and install the interlocking lighted barricades on the pavements whereas applicable as shown in the Construction Safety Phasing Plans. Prior reopening, the Contractor shall remove such temporary construction items and restore areas to the satisfaction of Airport Operations to reopen the respective pavement.

4. NAVAID PROTECTION

a. NAVAID will remain operational during construction, unless otherwise noted on the Construction Safety Phasing Plans. Any construction activities and materials/equipment storage near a NAVAID must not

obstruct access to the equipment and instruments for maintenance. Before commencing construction activity, parking vehicles, or storing construction equipment and materials near a NAVAID, the Contractor shall coordinate with BGR and the appropriate FAA ATO to evaluate the effects of construction activity and the required distances and direction from the NAVAID that may be required per the different aircraft traffic flow and VFR/IFR scenarios described herein for applicable phases. The Contractor shall never physically impede nor allow dust to impede such facilities. Temporary impacts to the Runway 15 Glideslope are anticipated during construction.

5. CONTRACTOR ACCESS

1) Construction Site Access and Haul Roads

a. Haul roads to be used on this project are indicated on the drawings or otherwise specifically authorized by the designer and Airport. The Contractor shall confine all vehicles and equipment to the designated construction areas, staging areas and haul routes.

b. Access points to the project work are shown on Sheet G-081 (Appendix A). The airport AOA security line shall be maintained at all times.

c. The Contractor shall restore all turfed and paved areas used for haul roads to their original condition, including establishment of new turf. All costs for constructing, removing, and restoring of haul roads required for the completion of the work shall be borne by the Contractor. The existing condition of all anticipated haul routes shall be documented prior to hauling.

d. The Contractor shall not permit any unauthorized construction personnel or traffic on the project site. The Contractor shall be responsible for traffic control at the project sites.

e. The Contractor shall be responsible for handling all material orders for delivery to the site.

f. It shall be the Contractor's responsibility to coordinate the use of off-site routes (state highways, county roads or city streets) with the appropriate owner who has jurisdiction over the affected route.

g. All vehicles using haul routes including off-site routes, shall be covered to prevent blowing away or spillage of loose material. All spillages on public roadways and site roads shall be promptly cleaned up and legally disposed of at no additional cost to the Airport.

h. The Contractor will not be permitted to use any access or haul roads other than those designated on the contract drawings. Aircraft Rescue and Fire Fighting (ARFF) right-of-way on access roads, haul roads, aprons, taxiways, and runways shall not be impeded at any time.

i. Flaggers for contractor crossing(s) of controlled movement areas are not anticipated for this project.

j. The contractor is required to coordinate the use of each gate with each phase shown on the phasing plans. No prohibited items (weapons, oxygen/acetylene tanks, welding equipment or other tools not required for work on the project) are to be in the vehicles brought into the AOA. The contractors shall provide airport-trained security gate guards at all access points when construction personnel require access to the AOA through each phase's designated gate(s). The exception to this is those times when the number of personnel is small, and the gate will be locked once all personnel have entered the AOA and no additional entry or exist will be required until the end of the day departure.

k. Unescorted access to the AOA work areas will be afforded to workers who have obtained an Airport Security Badge.

l. For all permitting and security instruction, contact Ms. Beth Martin, Manager of Airfield Operations at (207) 992 4602, for permitting and security training instructions.

m. For the access routes, the Contractor shall utilize marker flags, cones, stakes, and/or barricades whereas shown on the plans that will not interfere with the Instrument Landing System (ILS) signals, Safety Areas, Glide Slope Critical Areas, or Localizer Critical Areas to mark the allowable limits and stopping points requiring ATC permission for access and crossings of the respective areas.

n. Location of Stockpiled Materials

- There shall not be any stockpiled materials in the active runway OFA, taxiway OFA, or NAVAID critical areas. Stockpiled material or equipment shall not be stored near aircraft turning areas or operational movement areas, aprons, or excavations and trenches, or within 10 feet of AOA fencing. Stockpiled materials shall not be stored near navaids, visual or approach aids, nor shall they obstruct the ATCT's line of sight to any runway or taxiway. The Contractor shall ensure that stockpiled materials do not cause degraded or hazardous conditions to airport operations safety. This includes determining and verifying that stockpiled materials are stored at an approved location, that they are properly stowed to prevent foreign object debris (FOD), attraction by wildlife, or obstruction of air operations either by their proximity to navaids or to aircraft movement areas.
- All stockpiled material/supplies shall be constrained in a manner to prevent movement resulting from aircraft blast or wind conditions. Material(s)/supplies shall not be stored within 500 feet of aircraft turning areas or movement areas. Stockpiled material(s)/supplies shall not exceed 15 feet in height unless the Contractor has complied with all requirements for FAA airspace review and secured approval from FAA or BGR. All material(s)/supplies shall be positioned so it will not obstruct the line of sight from the control tower to the movement area. Marking and lighting shall be in accordance with the requirements contained in barricade details checklist.

o. Vehicle and Pedestrian Operations

- Contractor's staff vehicles not required on the project site shall be parked in an area designated by BGR. No vehicles shall be placed within 15 feet of either side of the airport fence or placed so as to block access to fire hydrants, gates, or other buildings or equipment.
- Vehicles operating in the Air Operations Area (AOA) must display company identification (name and/or logo) on both sides of the vehicle and comply with FAA Advisory Circular 150/5210-5, including 360 degree rotating amber beacons. Drivers must receive AOA driver training. All vehicles will be required to be permitted. Permits must be obtained through the Airport Operations office. All vehicles not driven by a badged movement-area driver trained employee must be escorted.
- All contractor employees shall display security badges at all times when working within the AOA. Badged employees who forget their badges may not be escorted by other badged employees; they must obtain a replacement badge at the airport badging or police office. Replacement badges must be returned to the airport badging or police office at the end of the work period. One badged employee may escort up to five non-badged employees as long as they remain within control by sight and sound.

p. Two-Way Radio Communications. All contractor radio escort vehicles operating within or crossing active movement areas are required to have two-way radio communications with ATC. All vehicles operating on the movement area must have radio contact with each other and with the radio escort or be escorted by a vehicle in radio contact with ATC. All radio escorts must be approved by Airport Operations and successfully pass radio communication and AOA driver training provided by Airport Operations.

q. Airport Security: All airport contractors must take care to maintain security during construction when access points are created in the security fencing to permit the passage of construction vehicles or personnel. The Contractor is responsible for maintaining adequate control of all related vehicles entering or leaving the airport through their employment of Gate Guard(s) at the AOA access gates. AOA access

gates must be locked at all times while not in use. Gate Guard(s) shall be security trained and approved by Airport Operations and employed by the Contractor.

6. WILDLIFE MANAGEMENT

Wildlife can be a very serious hazard within the AOA. Therefore, precautions must be taken to mitigate the following elements that attract wildlife or otherwise increase the risk caused by the presence of wildlife.

a. Trash: All construction personnel will dispose of all edibles (food scraps, etc.) or other miscellaneous garbage in closed containers provided by the contractor that prevents animals from rummaging through it. The contractor will empty all containers off-site at their expense.

b. Standing Water: The contractor will immediately re-grade any area with standing water remaining more than three (3) hours after rainfall. Pumping and disposal of standing water shall be performed in accordance with all local requirements.

c. Tall Grass and Seeds: The Contractor is responsible for maintaining its staging and parking areas free from tall strands of grass. Any area that has become disturbed by the Contractor shall become the responsibility of the Contractor until vegetation has been established and accepted. Only the seed indicated in the project documents shall be allowed for use in and around the Airport. The maintenance of the turf areas shall be coordinated with the Engineer and Airport at the progress meetings.

d. Disruption of Wildlife: In the event of a wildlife encounter (dog, fox, coyote, deer, etc.) within the AOA, the Contractor shall immediately contact the Airport Operations. It is not anticipated that wildlife habitat will be disrupted during the construction of this project.

e. Maintained Fencing and Gates: The access to the AOA will be through the existing and new temporary gates in the airport security fence as shown and as described by the Contract Plans.

7. FOD MANAGEMENT

Foreign Object Debris (FOD) is a serious hazard in the AOA and it can cause serious damage to aircraft, other equipment, and personnel. A worst-case scenario could lead to serious accidents resulting in injury or death. Sources of FOD include packaging associated with construction materials, construction materials, material containers, tools, food and beverage containers, etc.

The Contractor shall recognize that they are responsible and liable for their own FOD and its effects.

The Contractor shall instruct project personnel in recognizing FOD and the hazards it presents and provide receptacles for FOD collection. Demolition debris, packaging, tarps, geotextile material and other such items shall be cleaned up as they are produced, and placed in secure location or receptacle where they will not be subject to wind, jet blast, or other means of transport to the AOA surface. Loose debris that can be blown out of a vehicle shall be removed from any

open vehicle bed or equipment before entering or exiting the airfield. Before leaving the site at the end of each work period, Contractor shall inspect the area and clear it of any FOD.

a. The Contractor shall always keep all airfield pavements swept clean of debris during hauling and other construction operations. The contractor shall immediately sweep or otherwise remove any FOD located on the AOA.

b. The Contractor shall ensure all loads are secured and/or covered during transport and be loaded such that no spillage occurs during transit.

c. Waste and loose material will not be placed in active movement areas.

d. The Contractor shall provide continuous clean-up operations including a vacuum sweeper for all haul operations or other related traffic to and from the work site in the AOA. A vacuum truck and operator shall be on-site and available during all work hours and shall not leave the site prior to the daily sign-out by Airport Operations.

e. The Contractor shall control stockpiled material in an approved manner to prevent movement by weather or propeller or jet blast.

f. The Contractor shall keep a clean worksite and remove waste materials daily.

g. The Contractor is responsible to police all work areas continually for collection and disposal of any FOD whether self-generated or not.

h. The contractor shall employ appropriate equipment to provide dust control during construction operations including a water truck.

i. Airport Personnel will have the final word on the acceptance of cleaned construction areas for aircraft operations. If an area is found to be unacceptable, a Contractor representative shall be able to immediately remediate the items of concern.

8. HAZMAT MANAGEMENT

a. Management of hazardous materials is required in order to prevent environmental damage as well as protect property and personnel.

b. Hazardous materials common to construction sites include vehicle fuels, oils, lubricants, and hydraulic fluid as well as many compounds used for the actual construction work. Contractor shall store all such materials in containers approved for such use, shall have Safety Data Sheets (SDS) on site for all such materials, personnel trained in the use of clean-up materials, and shall have cleanup materials recommended by the SDS on site and readily available for use in the event of a spill. All materials shall be used in strict accordance to the manufacturer's instructions.

c. Transfer of materials from one container to another shall be done in areas where a spill is least likely to cause damage such as nearby streams, storm sewer inlets, etc. Fueling of vehicles and equipment shall be done at designated areas within the staging areas shown. The contractor shall provide appropriate spill kits for all refueling operations. All contaminated materials from used spill kits shall be removed from the site and properly disposed of immediately after use.

d. The following instructions, taken from FAA Advisory Circular 150-5320-15, current edition, shall be followed in the event of a hazardous material spill:

Cleanup-General

5) Clean up leaks and spills immediately. As appropriate, use a rag for small spills on paved surfaces, a damp mop for general cleanup, and absorbent material for larger spills. If the spilled material is hazardous, then the used cleanup materials are also hazardous and must be sent to either a certified laundry (rags) or disposed of as hazardous waste.

6) Never hose down or bury dry material spills. Clean up as much of the material as possible and dispose of properly.

Minor Spills. (under 5 Gallons, not entering a storm drain or waterway)

1) Minor spills typically involve small quantities of oil, gasoline, paint, etc. which can be controlled by the first responder at the discovery of the spill.
2) Use absorbent materials on small spills - do not hose down or bury the spill. Absorbent materials should be promptly removed and disposed of properly.
3) Follow the practice below for a minor spill:
   (a) Contain the spread of the spill.
   (b) Recover spilled materials.
   (c) Clean the contaminated area and properly dispose of contaminated materials.

Major Significant Spills. (5 Gals or more, not entering drain/waterway)

1) Semi-significant spills still can be controlled by the first responder along with the aid of other personnel such as laborers and the foreman, etc. This response may require the cessation of all other activities. Contractor shall immediately notify Airport Dispatch (207) 992-4623.
2) Spills shall be cleaned up immediately:
   (a) Contain spread of the spill.
   (b) Notify the project foreman immediately.
   (c) If the spill occurs on paved or impermeable surfaces, clean up using "dry" methods (absorbent materials, cat litter and/or rags). Contain the spill by encircling with absorbent materials and do not let the spill spread widely.
   (d) If the spill occurs in dirt areas, immediately contain the spill by constructing an earthen dike. Dig up and properly dispose of contaminated soil as directed by the Airport Environmental Program Manager.
   (e) If the spill occurs during rain, cover spill with tarps or other material to prevent contaminating runoff.

Significant/Hazardous Spills.

1) Significant or hazardous spills are defined as those that cannot be controlled by personnel in the immediate vicinity that exceed 5 gallons in volume, and/or impact surface water and/or soils. The following steps should be taken to address these spills:
   (a) Contractor shall immediately notify Airport Dispatch (207) 992-4623.
   (b) For spills of federal reportable quantities, in conformance with the requirements in 40 CFR parts 110,119, and 302, Bangor International Airport will notify the National Response Center at (800) 424-8802.
   (c) Notification should first be made by telephone and followed up with a written report.
   (d) The services of a spills contractor or a HAZMAT team shall be obtained immediately depending on the hazmat spilled. If the hazmat is determined to be too hazardous for construction personnel, contractors shall wait for County Hazmat team or contract services to respond at the job site to clean up the spill.
   (e) Other agencies which may need to be notified by BGR, including, but are not limited to, the BGR Fire Department, BGR Utility Department, Penobscot County 911, ME Department of Environmental Protection.

Reporting.

1) All spills, regardless of size, must be reported to the Airport Environmental Manager using the "Spill Incident Report Form". Report significant spills to the Airport Dispatch (207) 992-4623.
2) Federal regulations require that any significant oil spill into a water body or onto an adjoining shoreline be reported to the National Response Center (NRC) by BGR at 800-424-8802 (24 hours).

9. NOTIFICATION OF CONSTRUCTION ACTIVITIES

a. All airfield surface closures shall be coordinated by the Contractor with Airport Operations.

b. A list of responsible representatives/points of contact for all involved parties, and procedures for contacting each of them, including after hours, will be created and distributed upon award of the project. The Contractor shall designate a person and two (2) backup personnel who can be contacted 24 hours a day in the event of an emergency. These people shall be authorized to make decisions on the company's behalf and must physically respond within two hours to the site.

c. The 7460-1 submission for the project has been submitted to the FAA. The maximum equipment heights have been included on the Maximum Equipment Height Plans. Variations to the heights, if required, will require re-submission and re-approval of the FAA 7460-1 form.

d. Notice to Airmen (NOTAMS) will be issued and updated by Airport Operations with the latest airport construction information. The contractor has no involvement in the NOTAM process.

e. For fire emergency, Police and emergency medical response, call 911

10. INSPECTION REQUIREMENTS

a. The Contractor Superintendent is responsible for conducting routine inspections of the work site(s) to ensure compliance with the CSPP and address any deficiencies. The Contractor shall take action to prevent or remedy any unsafe or potentially unsafe conditions. The checklist found in Appendix D of FAA AC 150/5370-2G may be used to aid in the inspections.

b. Inspections should be conducted at least daily, but more frequently if necessary, to ensure conformance with the CSPP, with immediate remedy of any deficiencies, whether caused by negligence, oversight, or project scope change.

c. Inspections are an integral part of safety on construction projects. Contractor shall designate an employee as safety officer whose duty shall be to periodically inspect the work area with respect to safety issues.

    1) Daily Inspections: Inspections with Airport Operations shall be made daily at the beginning of work and before leaving at the end of the work shift to identify any problems, make sure that required barricades are in place and all lights are operating as required, and that the area is FAA Part 139 compliant. Any hazards shall be checked to ascertain that they are properly marked and protected.
    2) Final Inspections: Upon completion of the Contract Work, contractor shall make a final safety inspection of the area with the Airport to ensure that all work is complete as specified, that all of his equipment, tools and materials have been removed from the site, and that there are no safety issues related to his work.

11. UNDERGROUND UTILITIES

a. Locations of known underground utilities shown on the plans are approximate. All utility locations shall be field verified by the contractor through the use of an underground utilities location subcontractor prior to commencing construction. The Contractor shall contact the Maine Digsafe 811 at least three days prior to the beginning of any work, and coordinate with the Airport Engineering Office to locate any other utilities that traverse the site, including Airport and FAA owned utilities prior to beginning any work on the site.

b. The Contractor shall use care when performing work and protect the existing utilities that are to remain.

c. The Contractor Superintendent will suspend all construction activity upon the damage of any underground utility until the owner is identified and the utility repaired. Should an existing utility be damaged or disrupted, the Engineer shall be notified immediately. All costs shall be the responsibility of the Contractor. This repair shall be performed continuously until complete.

d. All marking of utilities shall be every 50 feet.

	Acronym	Color
Electrical loops (non-AOA)	use “ELEC”	red
Airfield Electrical	use “ELEC”	red
Natural Gas	use “NAT GAS”	yellow
Sanitary	use “SANIT”	brown
Storm	use “STORM”	brown
Combined Sewers	use “COMBO”	brown
Water (potable and fire)	use “WATER”	blue
FAA Copper	use “FAA COP”	red
FAA Fiber	use “FAA FIB”	orange
BGR Fiber	use “FIBER”	orange
Telephone	use “TELE”	orange
Jet Fuel	use “JET FUEL”	yellow
Glycol	use “GLYCOL”	blue
Oil	use “OIL”	yellow
Gasoline	use “GAS”	yellow
Diesel	use “DIESEL”	yellow
Steam	use “STEAM”	black
Condensate	use “CONDEN”	black

12. PENALTIES

a. Non-compliance by contractor personnel with airport rules and regulations or failure to comply with the airport’s approved CSPP may result in fines and/or liquidated damages as allowed by law and per the Contract Documents.

b. Contractor personnel driving on the AOA that violate the airport’s rules may have AOA driving privileges suspended or revoked, at the discretion of Airport Operations.

c. Contractor personnel failing to comply with the requirements herein will be reviewed on a case by case basis.

d. The airport may permanently prohibit any consultant or contractor employee acting in violation with or in disregard to airport rules and regulations from entering or working on airport property.

e. Security related infractions will result in the temporary suspension or revocation of the employee’s Security ID Badge. Employees who have had their security bade revoked may no longer work on the AOA, even if under escort. Other safety related violations of airport rules and regulations may result in temporary or permanent suspension of work or removal of the individual from the project.

13. SPECIAL CONDITIONS

a. Contractor access may be restricted during times of poor weather conditions, during emergencies, security breaches, or safety violations. Notification will be made by Airport Operations to the Airport Engineering Office and the Contractor. Work may not resume until notification from Airport Operations is received.

b. Should an aircraft inadvertently enter the work area, the Contractor will suspend work until the aircraft has safely been removed from the area. Safety measures currently in place will be re-evaluated.

c. All construction activity will cease should any national security matter require cessation of construction activities.

14. RUNWAY AND TAXIWAY VISUAL AIDS

a. The contractor shall place and maintain barricades to mark the closures of taxiways and to denote work area limits to maintain clearance from taxiways and/or runways. Barricades shall not be placed within the safety area of active runways or taxiways. Barricades shall conform to the details in the plans and shall be lit and filled to prevent movement by weather or jet blast.

b. The Contractor will be required to secure all temporary and permanent markings, lighting, signs, and visual aids to prevent any movement due to prop wash, jet blast, wing vortices, or other wind currents. Any temporary visual aids must be constructed and installed with materials that would minimize damage to an aircraft in the event of inadvertent contact.

c. The Contractor shall place barricades as shown in the construction safety phasing plans for closures when required.

d. When long-term closure of taxiways is required, the contractor shall turn off lighting, cover airfield guidance signs, remove markings, cover edge lights, and install the interlocking lighted barricades.

15. MARKING AND SIGNS FOR ACCESS ROUTES

a. Construction marking and signs must conform to the Federal Highway Administration Manual on Uniform Traffic Control Devices (MUTCD) and/or MEDOT specifications. Signs adjacent to areas used by aircraft must comply with the frangibility requirements of FAA AC 150/5220-23, Frangible Connections, which may require modification to size and height guidance in the MUTCD. No markings shall be placed without the Airport Operators written approval. For the access routes, the Contractor shall utilize marker flags, cones, stakes, and/or barricades where shown on the plans.

16. HAZARD MARKING, LIGHTING AND SIGNAGE

a. Lighted low-profile barricades have been specified for use around the work areas to prevent aircraft, vehicles, and pedestrians from entering the construction areas, as well as to keep contractor personnel and vehicles inside the designated construction areas. Gaps between barricades will not be allowed unless they are directed by the Engineer.

b. Barricade details have been included in the plans. Barricades shall be equipped with two (2) high intensity red flashing lights per barrier visible 360 degrees. Reflective international orange and white vertical stripes shall also be provided on each side of the barricade.

c. The Contractor shall inspect the barricades at least once per day, to ensure proper operation of lights and shall replace any light not working. The Contractor shall have a designated person on call 24 hours a day for emergency maintenance of any airport hazard lighting or barricades.

17. WORK ZONE LIGHTING FOR NIGHTTIME CONSTRUCTION

a. Requirements including lighting equipment, portability, positioning, and aiming are included in the Contract plans and must be approved by the Airport operator upon setup and each time lights are relocated or repositioned while Runway 15-33 is open. Equipment in excess of 20 feet tall operating at night will be marked with red obstruction lights.

18. PROTECTION OF RUNWAY AND TAXIWAY SAFETY AREAS

a. The project requires construction activity within the critical areas of closed runways and taxiways. The following describes the requirements and procedures for runway and taxiway safety and object free areas, runway obstacle free zone, and approach and departure surfaces as stated in the FAA AC 150/5300-13B Airport Design.

b. Runway and taxiway safety areas provide a safe area adjacent to active pavements to allow aircraft to maneuver in the event of an emergency and the aircraft leaves the pavement. For this reason all safety areas must remain free of excavations, elevation changes greater than 3" (up or down) and storing, staging or stockpiling of any material or equipment. Safety areas must be protected during all construction activities and comply with all FAR Part 139 Standards. Any work within a safety area must be coordinated through the Engineer and BGR Operations. Work will only be permitted in these areas when a runway or taxiway is closed or restricted for a lesser aircraft design group.

c. Runway Safety Area (RSA): Equipment, open trenches, excavations and other construction activities within the RSA are only anticipated when the runway is closed. Under no circumstances are these activities permitted within the RSA while the runway is open. Runway Safety Areas at BGR for all runways are 500’ in width (250’ from runway centerline).

d. Runway Object Free Area (ROFA): Construction activities within or near the ROFA are anticipated with this project. Runway Object Free Areas at BGR for Runway 15-33 are 800' in width (400' from runway centerline) No stockpiles shall be placed within the ROFA while the runway is active.

e. Taxiway/Taxilane Safety Area (TSA): Equipment, open trenches, excavations or other construction activities within the Taxiway A TSA are anticipated with this project. These activities are not permitted within the TSA while the taxiway in that area is open. Taxiway Safety Areas vary according to Aircraft Design Group (ADG) in accordance with the following table. Taxiway A, K and M at BGR are ADG V.

Aircraft Design Group (ADG)	TSA Width	TSA Distance from Centerline
V	214'	107'

f. Taxiway/Taxilane Object Free Area (TOFA): Work within the TOFA is more restrictive than a ROFA due to the potential of an aircraft wingtip penetrating this area. Specific to this project, work is anticipated within a TOFA and sections of Taxiway A will be closed. Vehicular traffic entering open portions of the TOFA and any active movement areas must be controlled either by two-way radio with the ATCT, escort, flagmen, or other means appropriate for the particular activity. No parking or servicing of equipment will be permitted within an active TOFA. Unlike the TSA, TOFA distances and widths are different for taxiways and taxilanes. Taxiway A, M and K are ADG V.

Taxiway/Taxilane Aircraft Design Group (ADG)	TOFA Width (Taxiway/Taxilane)	TOFA Distance from Centerline (Taxiway/Taxilane)
V	285'/270'	142.5'/135'

g. Obstacle Free Zone (OFZ): Construction activities within an OFZ are only anticipated when the runway is closed. The contractor shall remain clear of all Obstacle Free Zones, at least 200' from runway centerlines.

h. Runway Approach/Departure Surfaces: Construction activities are not anticipated within the approach and departure surfaces of the Airport's runways.

19. OTHER LIMITATIONS ON CONSTRUCTION

a. Prohibitions:
   1) Smoking is not permitted on the AOA at any time.
   2) Hot work permits must be obtained from the Airport Fire Department for any work involving an open flame. Contact the Airport Fire Department non-emergency number at (207) 404-7235.
   3) No weapons allowed on the Airport.

b. Restrictions:

1) The maximum heights for Contractor's equipment have been denoted on the Maximum Equipment Height Plans. Cranes and other tall equipment exceeding the maximum equipment heights shall not be used until a 7460-1 determination letter has been issued.
2) The Contractor will meet with BGR Operations at the security gate at the beginning of each shift. At this time, the Contractor will be instructed as to which access/restriction scenario (option) will be enforced for the given day. Traffic patterns may change during the day and may include the switching of the runway landing ends or the change from VFR to IFR conditions or vice versa. BGR Operations will notify Contractor of changes in access restrictions and allowable access routes (Option Number) prior to the change. The contractor will also meet with Airport Operations at the gate prior to departing the area at the end of each work shift.
3) The speed limit for all vehicles on the haul routes is 15 MPH.
4) Contractor access may be restricted during times of poor weather conditions, during emergencies, security breaches, or safety violations. Notification will be made by Airport Operations to the Engineer and the Contractor. Work may not be resumed until notification from Airport Operations is received.
5) Following a snowfall event, Contractor shall coordinate with Engineer regarding access restrictions.
6) Allowable working hours are denoted within the Contract documents specific to each phase. Contractor must keep BGR advised of their intended "normal" working hours at least 72 hours in advance.

APPENDIX -1

CSPP DRAWINGS

LEGEND

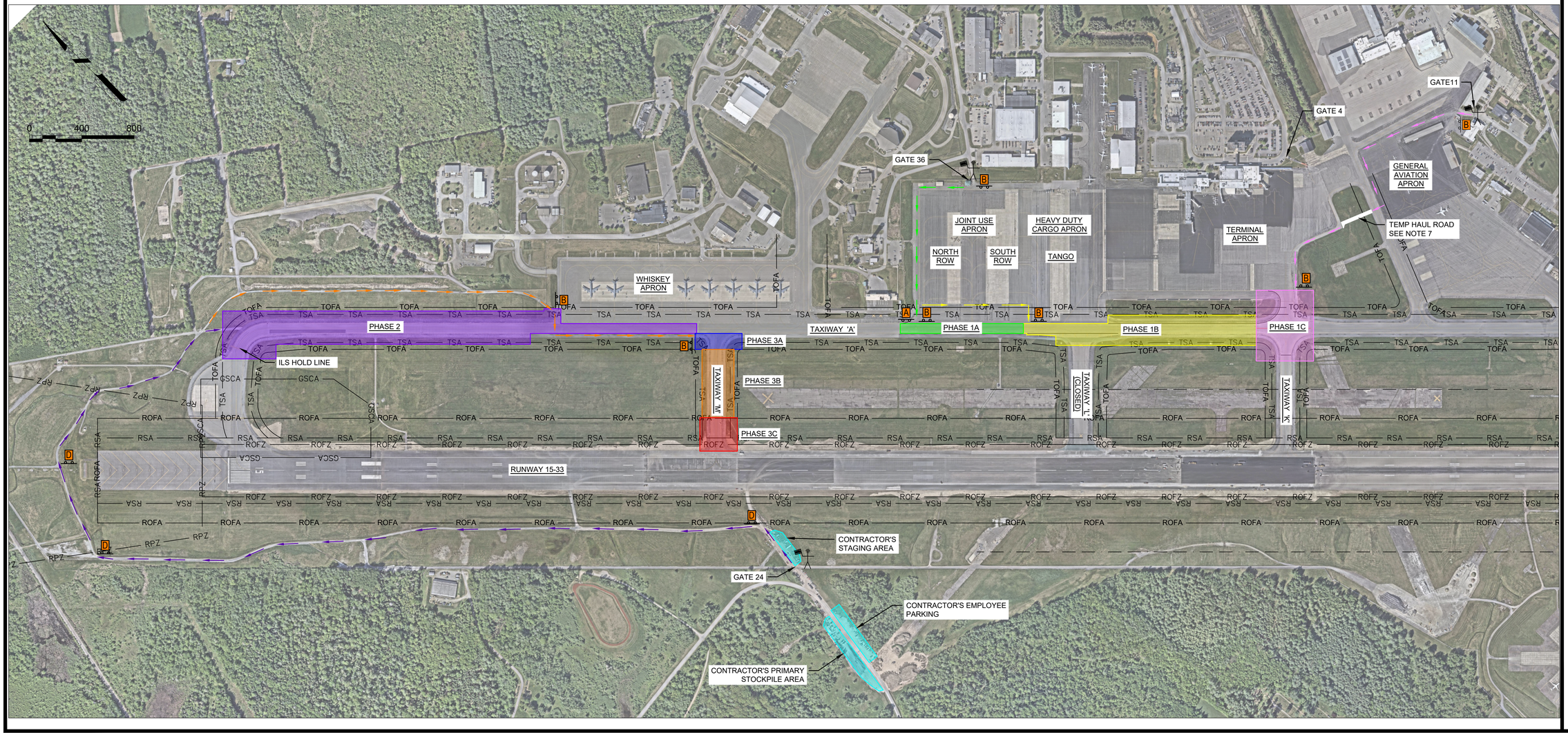
- CONSTRUCTION PHASE 1A
- CONSTRUCTION PHASE 1B
- CONSTRUCTION PHASE 1C
- CONSTRUCTION PHASE 2
- CONSTRUCTION PHASE 3A
- CONSTRUCTION PHASE 3B
- CONSTRUCTION PHASE 3C
- FULL TIME GATE KEEPER
- PHASE 1A & 1B HAUL ROUTE (ESCORT REQUIRED - SEE NOTE 8)
- PHASE 1B HAUL ROUTE (ESCORT REQUIRED - SEE NOTE 8)
- PHASE 1C HAUL ROUTE (ESCORT REQUIRED - SEE NOTE 8)
- PHASE 2 & 3 HAUL ROUTE
- PHASE 3 HAUL ROUTE (ESCORT REQUIRED FROM SIGN LOCATION SHOWN ON DRAWING- SEE NOTE 8)
- STAGING AND PARKING

NOTES:

1. ALL WORK AND MATERIALS FOR THE CONSTRUCTION AND SAFETY PLANS SHALL BE PAID FOR UNDER ITEM X-106-5.1.
2. ALL WORK WITHIN THE PHASE 3A AND 3C SHALL BE COMPLETED AT NIGHT BETWEEN THE HOURS OF 12AM AND 5AM. LIGHTED "X"s SHALL BE PLACED PRIOR TO ANY WORK OCCURRING. THE AIRPORT SHALL BE RESPONSIBLE FOR ISSUING THE APPROPRIATE NOTICE TO CLOSE THE RUNWAY. SEE RUNWAY CLOSURE PROCEDURES ON THIS DRAWING AND THE CSPP FOR ALTERNATE AIRCRAFT ROUTES.
3. AT ALL CONTRACTOR ACCESS GATES, THE CONTRACTOR TO PROVIDE FULLTIME GATE KEEPER TO MAINTAIN SITE SECURITY AT ALL TIMES DURING CONSTRUCTION ACTIVITIES. CONTRACTOR VEHICLES SHALL BE HELD ON THE LAND SIDE OF GATE UNTIL ESCORT VEHICLE ARRIVES.
4. ALL HAULING OF MATERIALS SHALL OCCUR DURING THE DAY BETWEEN THE HOURS OF 6AM TO 7PM MONDAY TO SATURDAY, NO HAULING WILL BE ALLOWED ON SUNDAYS.
5. ALL CONTRACTOR EQUIPMENT SHALL BE REMOVED FROM THE RUNWAY OBJECT FREE AREA (ROFA) WHEN NOT IN USE, AND MATERIAL SHALL NOT BE STOCKPILED IN THE ROFA.
6. ALL WORK ASSOCIATED WITH THE IMPLEMENTATION OF THE CONSTRUCTION SAFETY AND PHASING PLAN (CSPP) AND THE CONTRACTOR'S SUPPLEMENTAL SAFETY PLAN (SPCD) SHALL BE PAID FOR UNDER ITEM CONSTRUCTION SAFETY PHASING PLAN REQUIREMENTS.
7. CONTRACTOR TO BUILD TEMPORARY CONSTRUCTION HAUL ROAD. THE AIRPORT HAS A STOCKPILE OF EXISTING ASPHALT MILLINGS THAT THE CONTRACTOR CAN USE FOR THIS TEMPORARY ROAD. CONTRACTOR TO REMOVE TEMPORARY ROAD AT THE END OF PHASE 1C CONSTRUCTION AND RESTORE WITH LOAM AND SEED.
8. WHEN CROSSING ACTIVE AIRSIDE PAVEMENT ALL DRIVERS ARE TO HAVE TAKEN THE AIRPORT'S DRIVER TRAINING PROGRAM OR ARE TO FOLLOW AN ESCORT VEHICLE DRIVEN BY A TRAINED DRIVER.

SIGN LEGEND

- A — ACCESS WORK AREA HERE
- B — STOP WAIT FOR ESCORT
- C — CONSTRUCTION VEHICLES PROHIBITED
- D — CONSTRUCTION VEHICLES ← THIS WAY



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BANGOR INTERNATIONAL AIRPORT

TAXIWAY 'A' & 'M' RECONSTRUCTION / REHABILITATION

287 GODFREY BOULEVARD
BANGOR, ME 04401

ISSUED
11/07/2025 30% SUBMISSION
02/26/2026 90% SUBMISSION

ISSUED FOR BID
MARCH 6, 2026

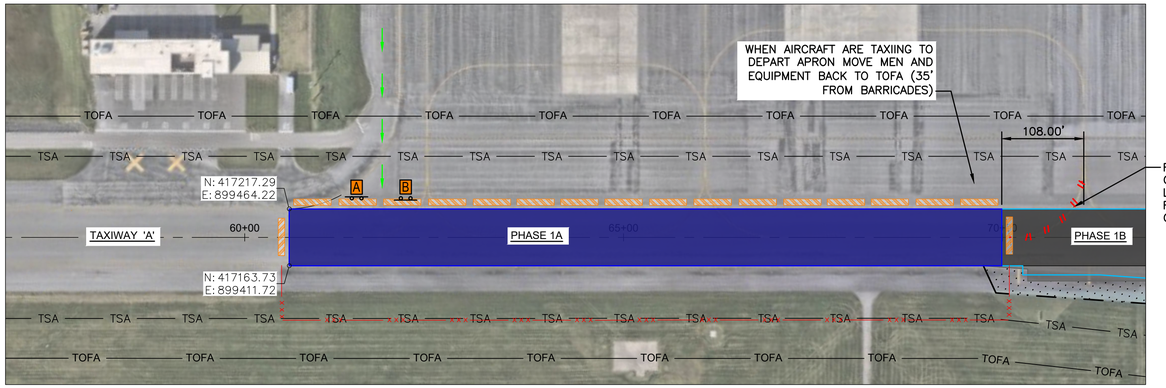
NOT FOR CONSTRUCTION

M&H NO.: 4242100-251517.01
DATE: MARCH 6, 2026
DESIGNED BY: CBS
DRAWN BY: JCD
CHECKED BY: LAB
DO NOT SCALE DRAWINGS

SHEET CONTENTS
CONSTRUCTION SAFETY AND PHASING PLAN LAYOUT

SHEET NO.
G-081

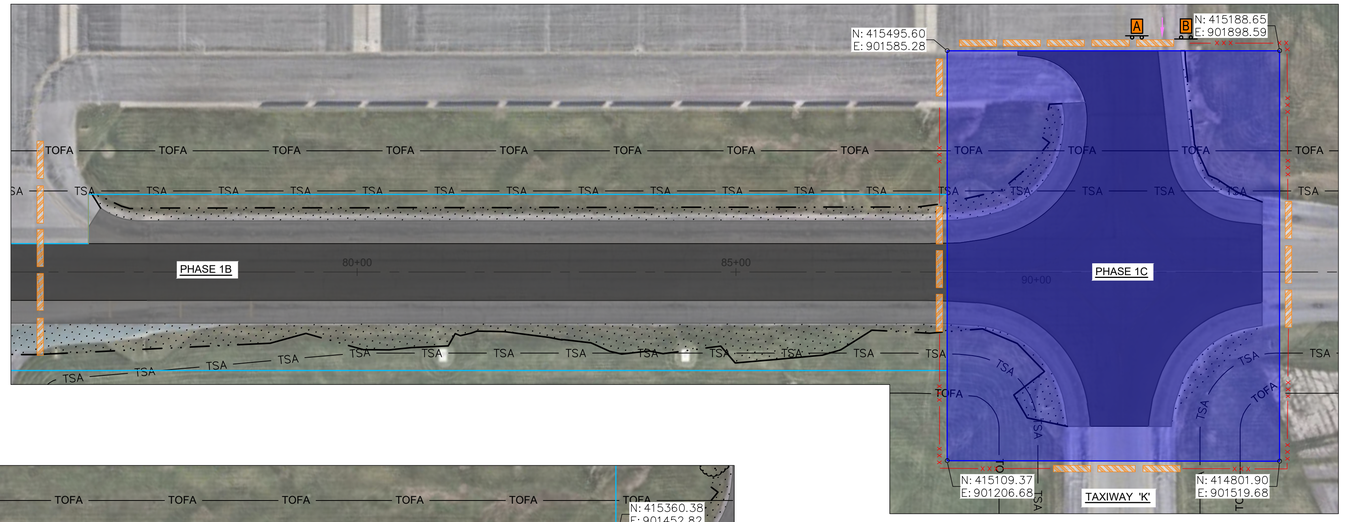
X:\4242100\251517.01\TECH\CAD\G-081 CONSTRUCTION SAFETY AND PHASING PLAN.DWG
3/6/2026 9:30:00 AM



PHASE 1A:
DURATION: 18 CALENDAR DAYS
WORK SCHEDULE: THIS PHASE SHALL NOT BE CONSTRUCTED CONCURRENTLY WITH ANY OTHER PHASE
CLOSURES:
- **TAXIWAY A FROM STA 60+58 TO STA 70+00**

MAJOR WORK ITEMS:
- **PAVEMENT REMOVAL**
- **CONCRETE RUBBLIZATION**
- **LEVELING BASE COURSE**
- **BITUMINOUS SURFACE COURSE**

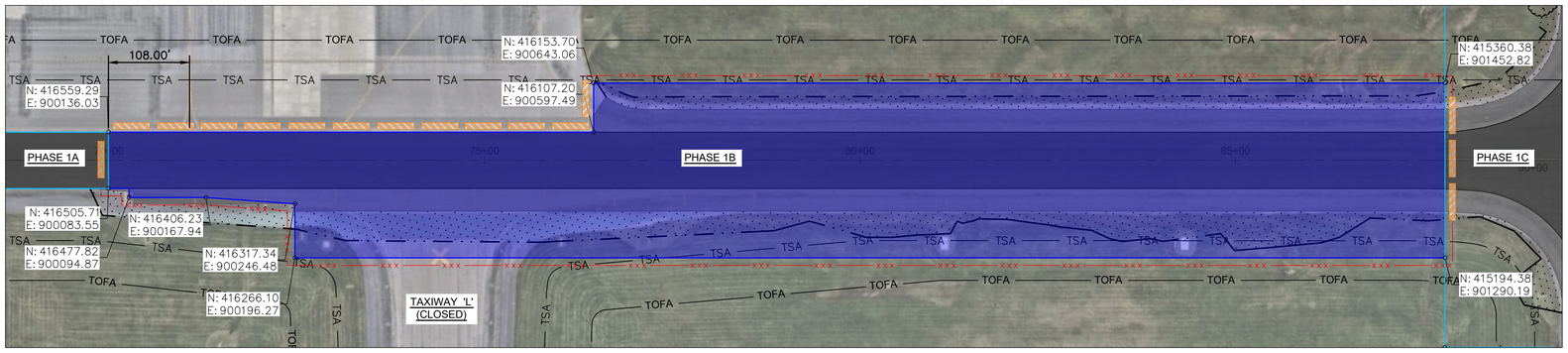
AFFECT ON NAVAIDS:
- **NONE**



PHASE 1C:
DURATION: 18 CALENDAR DAYS
WORK SCHEDULE: THIS PHASE SHALL NOT BE CONSTRUCTED CONCURRENTLY WITH ANY OTHER PHASE
CLOSURES:
- **TAXIWAY A / TAXIWAY K INTERSECTION**

MAJOR WORK ITEMS:
- **PAVEMENT REMOVAL**
- **CONCRETE RUBBLIZATION**
- **LEVELING BASE COURSE**
- **BITUMINOUS SURFACE COURSE**
- **TOPSOIL AND SEED**
- **TAXIWAY EDGE LIGHTS**

AFFECT ON NAVAIDS:
- **NONE**



PHASE 1B:
DURATION: 20 CALENDAR DAYS
WORK SCHEDULE: THIS PHASE SHALL NOT BE CONSTRUCTED CONCURRENTLY WITH ANY OTHER PHASE
CLOSURES: TAXIWAY A FROM STA 70+00 TO STA 87+79
MAJOR WORK ITEMS:
- **PAVEMENT REMOVAL**
- **CONCRETE RUBBLIZATION**
- **LEVELING BASE COURSE**
- **BITUMINOUS SURFACE COURSE**
- **TOPSOIL AND SEED**
- **TAXIWAY EDGE LIGHTS**

AFFECT ON NAVAIDS:
- **NONE**

SIGN LEGEND

A	ACCESS WORK AREA HERE
B	STOP WAIT FOR ESCORT
C	CONSTRUCTION VEHICLES PROHIBITED
D	CONSTRUCTION VEHICLES ← THIS WAY

LEGEND

- ACTIVE PHASE
- INACTIVE PHASE
- PROPOSED FULL STRENGTH PAVEMENT REHABILITATION LIMIT
- PROPOSED SHOULDER PAVEMENT REHABILITATION LIMIT
- FULL TIME GATE KEEPER
- XXX — ORANGE SAFETY FENCE 48" HIGH STAKED WITH GRADE STAKES
- BARRICADES (INTERLOCKED) SEE DETAIL G-05
- CHANNELIZER CONES (4' SPACING) SEE DETAIL G-085

0 100 200

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ISSUED FOR BID
MARCH 6, 2026

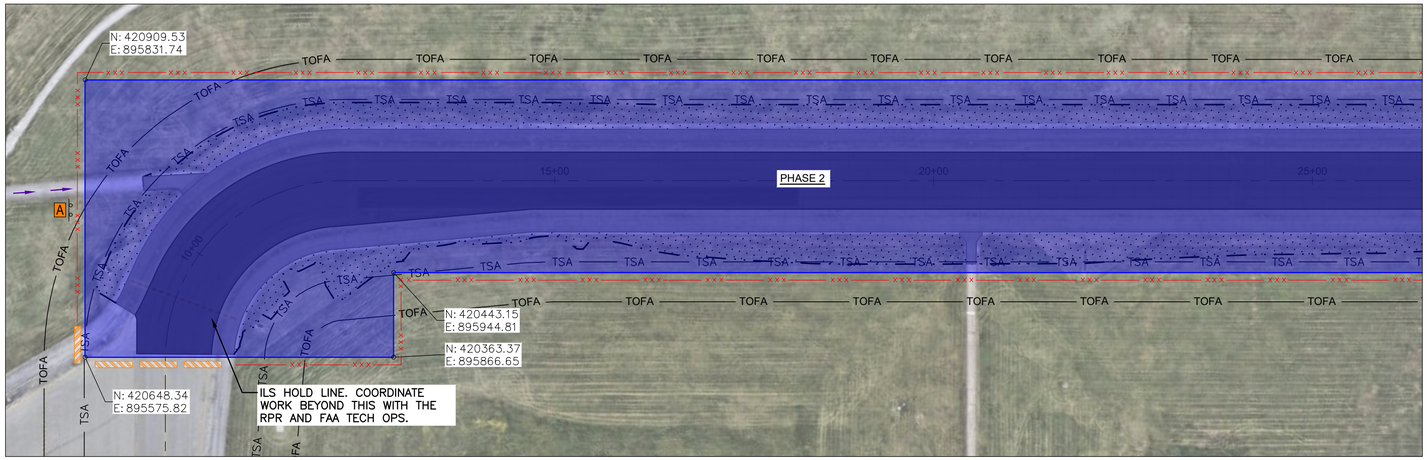
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M&H NO.: 4242100-251517.01
DATE: MARCH 6, 2026
DESIGNED BY: CBS
DRAWN BY: JCD
CHECKED BY: LAB
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SHEET CONTENTS
PHASE -1-

SHEET NO.
G-082

X:\4242100\251517.01\TECH\CAD\G-081 CONSTRUCTION SAFETY AND PHASING PLAN.DWG
3/6/2026 9:30:10 AM



PHASE 2:

DURATION: 55 CALENDAR DAYS

WORK SCHEDULE: THIS PHASE SHALL NOT BE CONSTRUCTED CONCURRENTLY WITH ANY OTHER PHASE

CLOSURES:

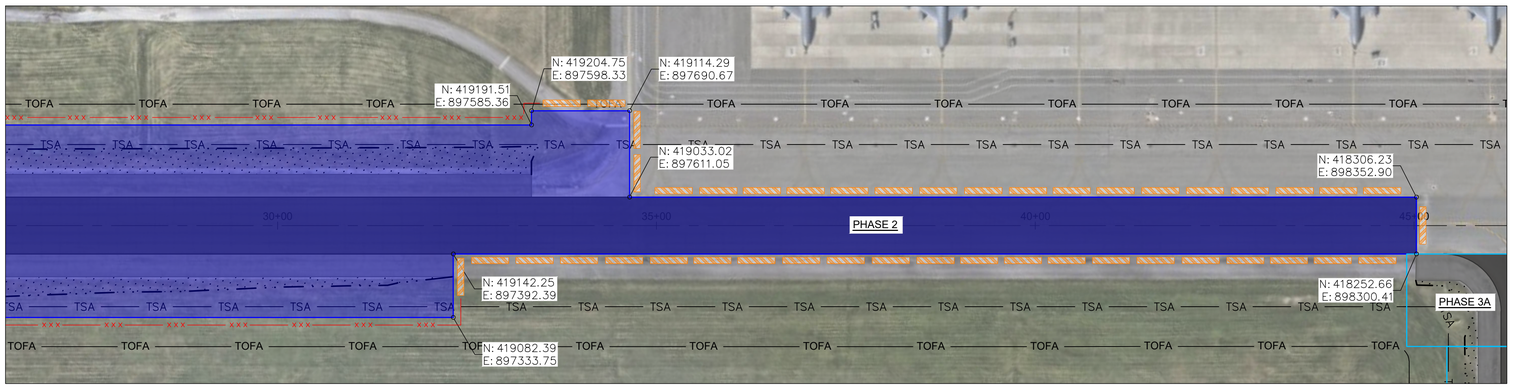
- **TAXIWAY A WEST OF TAXIWAY M TO THE ILS HOLD LINE**

MAJOR WORK ITEMS:

- **PAVEMENT REMOVAL**
- **CONCRETE RUBBLIZATION**
- **LEVELING BASE COURSE**
- **BITUMINOUS SURFACE COURSE**
- **GROOVE PAVEMENT SURFACE**
- **REPLACE STORM DRAIN PIPE AND CATCH BASINS**
- **RSA AND DITCH GRADING**
- **TOPSOIL AND SEED**
- **TAXIWAY EDGE LIGHTS**

AFFECT ON NAVAIDS:

- **ALTHOUGH THIS WORK IS OUTSIDE THE GSCA, COORDINATE WITH FAA TECH OPS TO DETERMINE IF THE EQUIPMENT BEING USED COULD STILL AFFECT THE GLIDE SLOPE SIGNAL.**



SIGN LEGEND

A	ACCESS WORK AREA HERE
B	STOP WAIT FOR ESCORT
C	CONSTRUCTION VEHICLES PROHIBITED
D	CONSTRUCTION VEHICLES ← THIS WAY

LEGEND

- ACTIVE PHASE
- INACTIVE PHASE
- PROPOSED FULL STRENGTH PAVEMENT REHABILITATION LIMIT
- PROPOSED SHOULDER PAVEMENT REHABILITATION LIMIT
- FULL TIME GATE KEEPER
- ORANGE SAFETY FENCE 48" HIGH STAKED WITH GRADE STAKES
- BARRICADES (INTERLOCKED)
- CHANNELIZER CONES (4' SPACING)

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02/26/2026 90% SUBMISSION

ISSUED FOR BID
MARCH 6, 2026

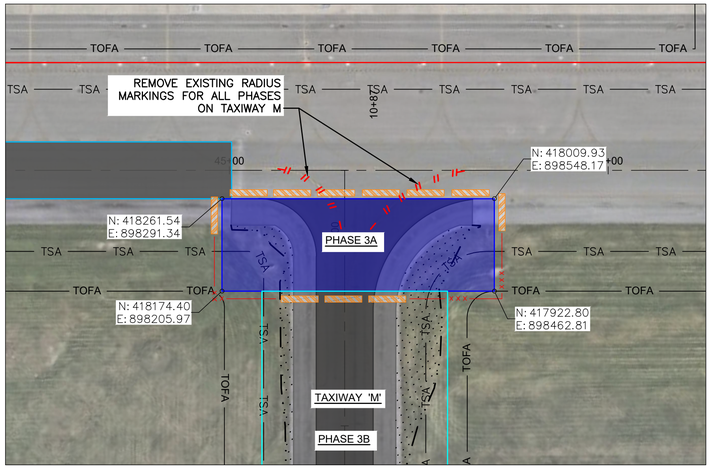
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M&H NO.: 4242100-251517.01
DATE: MARCH 6, 2026
DESIGNED BY: CBS
DRAWN BY: JCD
CHECKED BY: LAB
DO NOT SCALE DRAWINGS

SHEET CONTENTS
PHASE -2-

SHEET NO.
G-083

X:\4242100\251517.01\TECH\CAD\G-081 CONSTRUCTION SAFETY AND PHASING PLAN.DWG
3/6/2026 9:30:17 AM



PHASE 3A:

DURATION: 7 CALENDAR DAYS
WORK SCHEDULE: THIS PHASE MUST BE COMPLETED AT NIGHT BETWEEN THE HOURS OF 12AM AND 5AM. PHASE CAN BE WORKED ON CONCURRENTLY WITH PHASE 3B BUT MUST BE COMPLETED WITHIN 10 CALENDAR DAYS.
CLOSURES:

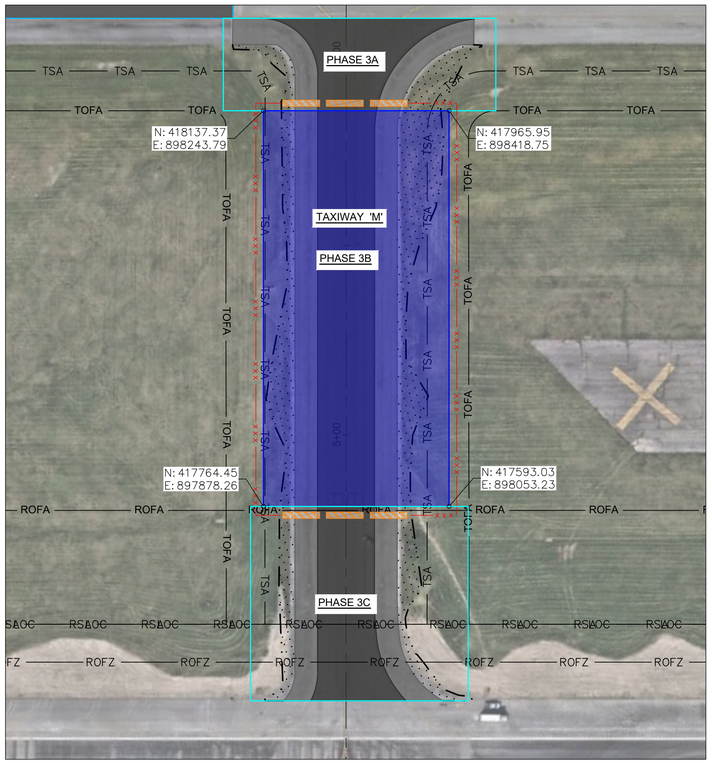
- **TAXIWAY M**
- **TAXIWAY A SOUTH OF TAXIWAY M**

MAJOR WORK ITEMS:

- **PAVEMENT REMOVAL**
- **LEVELING BASE COURSE**
- **BITUMINOUS SURFACE COURSE**
- **TOPSOIL AND SEED**
- **TAXIWAY EDGE LIGHTS**

AFFECT ON NAVAIDS:

- **NONE**



PHASE 3B:

DURATION: 10 CALENDAR DAYS
WORK SCHEDULE: PHASE CAN BE WORKED ON CONCURRENTLY WITH PHASE 3A
CLOSURES:

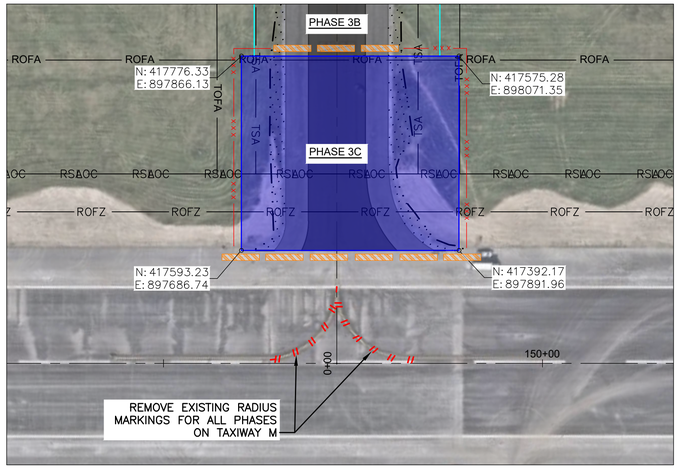
- **TAXIWAY M**

MAJOR WORK ITEMS:

- **PAVEMENT REMOVAL**
- **LEVELING BASE COURSE**
- **BITUMINOUS SURFACE COURSE**
- **TOPSOIL AND SEED**
- **TAXIWAY EDGE LIGHTS**

AFFECT ON NAVAIDS:

- **NONE**



PHASE 3C:

DURATION: 10 CALENDAR DAYS
WORK SCHEDULE: THIS PHASE MUST BE COMPLETED AT NIGHT BETWEEN THE HOURS OF 12AM AND 5AM. PHASE CAN BE WORKED ON CONCURRENTLY WITH PHASE 3B BUT MUST BE COMPLETED WITHIN 10 CALENDAR DAYS.
CLOSURES:

- **TAXIWAY M**

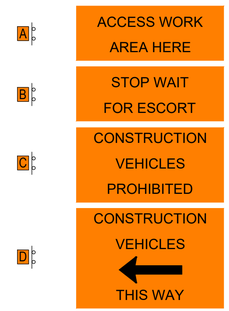
MAJOR WORK ITEMS:

- **PAVEMENT REMOVAL**
- **LEVELING BASE COURSE**
- **BITUMINOUS SURFACE COURSE**
- **TOPSOIL AND SEED**
- **TAXIWAY EDGE LIGHTS**

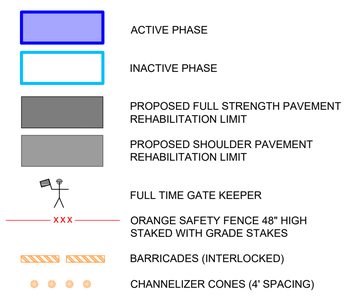
AFFECT ON NAVAIDS:

- **NONE**

SIGN LEGEND

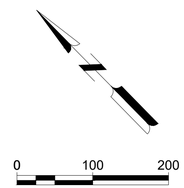


LEGEND



RUNWAY CLOSURE PROCEDURE

1. CONTRACTOR TO NOTIFY AIRPORT ONE WEEK IN ADVANCE OF RUNWAY CLOSURE REQUEST.
2. CONFIRM AIRPORT HAS POSTED NOTAMS FOR CLOSURE.
3. PLACE LIGHTED "X"s ON THRESHOLD NUMBERS AT EACH END OF THE RUNWAY THAT IS TO BE CLOSED.
4. DISCONNECT RUNWAY ELECTRICAL CIRCUITS AND ENSURE THE CIRCUIT IS LOCKED OUT, FOLLOWING LOCK OUT/TAG OUT PROCEDURES.
5. START WORK WITHIN RUNWAY SAFETY AREA CONTRACTOR IS TO BE CONTINUALLY SWEEPING AND MONITORING F.O.D. ON ANY PAVEMENTS THAT THE CONTRACTOR IS USING FOR CROSSING POINTS. WORK MUST BE STOPPED 1 HOUR BEFORE RUNWAY IS SCHEDULED TO BE OPENED TO ALLOW FOR AIRPORT STAFF TO INSPECT AND APPROVE FOR RE-OPENING. ANY F.O.D. OR DEFICIENCIES FOUND ON THE PAVEMENT SHALL BE CORRECTED IMMEDIATELY TO ALLOW FOR SCHEDULED OPENING.



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ISSUED FOR BID
MARCH 6, 2026

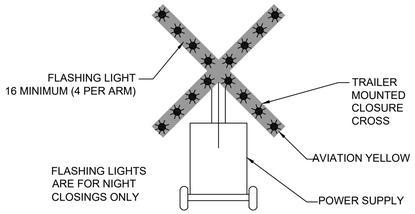
NOT FOR CONSTRUCTION

M&H NO.: 4242100-251517.01
DATE: MARCH 6, 2026
DESIGNED BY: CBS
DRAWN BY: JCD
CHECKED BY: LAB
DO NOT SCALE DRAWINGS

SHEET CONTENTS
PHASE -3-

SHEET NO.
G-084

X:\4242100\251517.01\TECH\CAD\G-081 CONSTRUCTION SAFETY AND PHASING PLAN.DWG
3/6/2026 9:30:27 AM



TEMPORARY CLOSURE CROSS DETAIL

NOTE:

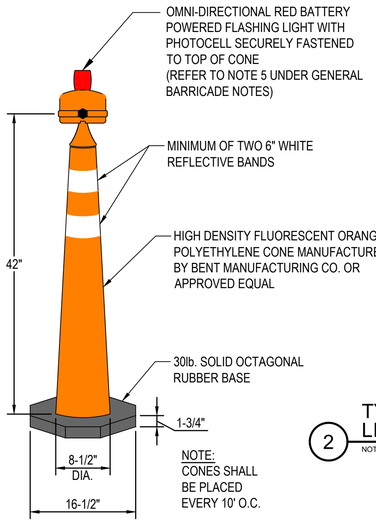
1). THE CONTRACTOR SHALL FURNISH AND SUPPLY. THE CONTRACTOR SHALL MAINTAIN TWO GENERATOR-POWERED, LIGHTED CLOSURE MARKERS FOR THE DURATION REQUIRED. MARKERS SHALL BE MOVED, FUELED, OILED AND MAINTAINED BY THE CONTRACTOR FOR THE DURATION REQUIRED.

2). MARKERS SHALL BE PLACED ON RUNWAY NUMERALS FOR THE ENTIRE PERIOD OF TIME THAT RUNWAY15-33 IS CLOSED AS SHOWN.

3). CLOSURE MARKERS SHALL BE CERTIFIED AND CURRENTLY APPROVED EQUIPMENT PER THE CURRENT EDITIONS OF FAA AC 150/5345-53 AND FAA AC 150/5345-55.

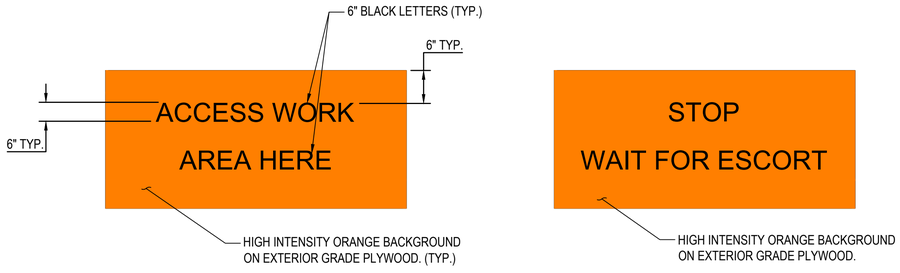
1 CLOSED RUNWAY LIGHTED X

NOT TO SCALE



2 TYPICAL WORK AREA LIGHTED CHANNELIZER CONE

NOT TO SCALE



SIGN A

SIGN B

SIGN C

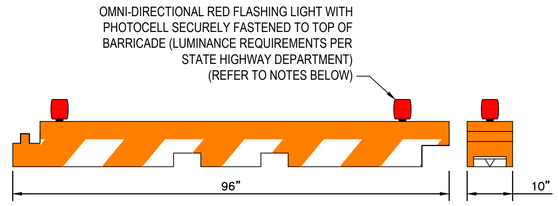
SIGN D

CONSTRUCTION SIGN NOTES:

1. SIGN SHALL CONFORM TO LATEST FHWA "STANDARD HIGHWAY SIGNS"
2. THE CONTRACTOR SHALL LOCATE SIGNS A & B AT ALL ACCESS/EGRESS POINTS. SIGNS C & D SHALL BE LOCATED AT THE TEMPORARILY RELOCATED PERIMETER ROAD. SIGNS SHALL BE PROVIDED BY THE CONTRACTOR AND PAID FOR UNDER ITEM X-106-5.1.
3. SIGNS SHALL NOT BE MOUNTED HIGHER THAN 4' ABOVE EXISTING GRADE.
4. IF WORKING IN MULTIPLE NON ADJACENT AREAS, THE CONTRACTOR SHALL PROVIDE ANY ADDITIONAL SIGNS REQUIRED AT THEIR OWN EXPENSE. THESE SIGNS SHALL REMAIN THE CONTRACTORS PROPERTY AT THE COMPLETION OF THE PROJECT.
5. THE CONTRACTOR SHALL ANCHOR THE SIGNS TO RESIST JET BLAST.

3 CONSTRUCTION SIGN

NOT TO SCALE



GENERAL BARRICADE NOTES:

1. THE RESIDENT PROJECT REPRESENTATIVE (RPR) AND BGR OPERATIONS SHALL HAVE FINAL DETERMINATION FOR THE PLACEMENT OF EACH TYPE OF BARRICADE
2. WATER BALLASTED BARRICADES SHALL BE PLACED AND CONNECTED END TO END TO CREATE A CONTINUOUS BARRICADE UNLESS NOTED OR SPECIFIED BY THE RPR OR BGR OPERATIONS.
3. ALL BARRICADES SHALL MEET THE EXISTING FAA REQUIREMENTS OF FAA ADVISORY CIRCULAR 150/5370-2G (CURRENT EDITION).
4. BARRICADES SHALL BE ADEQUATELY WEIGHTED DOWN TO WITHSTAND HIGH WINDS AND/OR JET BLAST.
5. CONTRACTOR TO SUPPLY BARRICADES AND CHANNELIZER CONES AND SHALL NOT RELY ON BGR TO SUPPLY. PAYMENT FOR BARRICADES IS UNDER ITEM X-106-5.1.

4 WATER BALLASTED LIGHTED SAFETY BARRICADE

NOT TO SCALE

Mead & Hunt

Mead and Hunt, Inc.
1 City Center, Suite 4110
Portland, ME 04101
meadhunt.com

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BANGOR INTERNATIONAL AIRPORT

TAXIWAY 'A' & 'M' RECONSTRUCTION / REHABILITATION

287 GODFREY BOULEVARD
BANGOR, ME 04401

ISSUED

11/07/2025 30% SUBMISSION
02/26/2026 90% SUBMISSION

ISSUED FOR BID
MARCH 6, 2026

NOT FOR CONSTRUCTION

M&H NO.: 4242100-251517.01
DATE: MARCH 6, 2026
DESIGNED BY: CBS
DRAWN BY: JCD
CHECKED BY: LAB
DO NOT SCALE DRAWINGS

SHEET CONTENTS

CONSTRUCTION SAFETY AND PHASING DETAILS

SHEET NO.

G-085

X:\4242100\251517.01\TECH\CAD\G-081 CONSTRUCTION SAFETY AND PHASING PLAN.DWG
3/6/2026 9:30:32 AM

APPENDIX -2

PROJECT CONTACT LIST

BGR TAXIWAY A & M CONTACT LIST

Company Name	Contact Name	Contact Title	Phone Number	Email Address
BANGOR INTERNATIONAL AIRPORT	DISPATCH		207 992 4623	
FAA TECH OPERATIONS			207 561 2600	
BANGOR INTERNATIONAL AIRPORT	MAINTENANCE DEPT		207 992 4578	
BANGOR INTERNATIONAL AIRPORT	FUEL DEPARTMENT		207 992 4643	
BANGOR INTERNATIONAL AIRPORT	BETH MARTIN	Manager of Airfield Operations	207 992 4602	bmartin@flybangor.com
BANGOR INTERNATIONAL AIRPORT	JOSE SAAVEDRA	Airport Director	207 992 4605	jsaavedra@flybangor.com
BANGOR INTERNATIONAL AIRPORT	FRANCIS ROBBINS	Assistant Airport Director Operations	207 992 4608	frobbins@flybangor.com
MEAD & HUNT (ENGINEER)	LEIGH BARTLETT	PROJECT MANAGER	207 807 8279	leigh.bartlett@meadhunt.com
MEAD & HUNT (ENGINEER)	TBD	RPR	TBD	
CONTRACTOR PROJECT MANAGER				
CONTRACTOR SUPERINTENDENT				
CONTRACTOR SAFETY OFFICER				

APPENDIX 2

GEOTECHNICAL REPORT

REPORT

25-0600 S

October 1, 2025

Explorations, Laboratory Testing and Geotechnical Engineering Services

Proposed Taxiway A Reconstruction
Bangor International Airport
Bangor, Maine

Prepared For:
Mead & Hunt
Attention: Leigh Bartlett, P.E.
75 Washington Avenue, Suite 202
Portland, ME 04101

Prepared By:
S. W. Cole Engineering, Inc.
37 Liberty Drive
Bangor, ME 04401
Tel: (207) 848-5714

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1.1 Scope and Purpose 1
1.2 Site and Proposed Construction 1
2.0 EXPLORATION AND TESTING 2
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2.2 Field Testing 2
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3.1 Soil and Bedrock Conditions 3
3.2 Groundwater 4
4.0 RECOMMENDATIONS AND LABORATORY TEST RESULTS 4
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5.0 CLOSURE 5

Appendix A Limitations
Appendix B Figures
Appendix C Exploration Logs & Key
Appendix D Pavement Core Photographs
Appendix E Laboratory Test Results

25-0600 S

October 1, 2025

Mead & Hunt
Attention: Leigh Bartlett, P.E.
75 Washington Avenue, Suite 202
Portland, ME 04101

Subject: Explorations, Laboratory Testing and Geotechnical Engineering Services
Proposed Taxiway A Reconstruction
Bangor International Airport
Bangor, Maine

Dear Leigh:

In accordance with our Proposal, dated April 11, 2025, we have performed subsurface explorations for the subject project. This report summarizes our findings and geotechnical recommendations and its contents are subject to the limitations set forth in Appendix A.

1.0 INTRODUCTION

1.1 Scope and Purpose

The purpose of our services was to obtain subsurface information at the site and to provide field and laboratory testing for use by others in planning and design of the project. As requested, the assessment has included obtaining eighteen pavement cores, four test boring explorations, field and laboratory testing, and preparation of this report.

1.2 Site and Proposed Construction

The site is located at the existing Bangor International Airport (BGR) at 287 Godfrey Boulevard in Bangor, Maine. We understand the project includes the design for the Taxiway A reconstruction and adjacent connector Taxiways. Additionally, we understand improvements or reconstruction may be performed for Taxiway M. Existing site features are shown on the “Exploration Location Plan” attached in Appendix B.

2.0 EXPLORATION AND TESTING

2.1 Explorations

Eighteen pavement cores (C-1 through C-18) were made at the site on August 25 and 26, 2025, by Seaboard Drilling, LLC under subcontract to S. W. Cole Engineering, Inc. (S.W.COLE). Four test borings (B-1 through B-4) were advanced through the core holes following the coring efforts. Additionally, auger flight soil samples were obtained at 4 offset borings locations, designated with an "A," for subsequent laboratory testing.

The exploration locations were selected by Mead & Hunt and RDM International, Inc. and established at the site by S.W.COLE using a sub-meter GPS unit. The approximate exploration locations are shown on "Exploration Location Plan," attached in Appendix B. Logs of the explorations and a key to the notes and symbols used on the logs are attached in Appendix C. Photographs of the pavement cores are attached in Appendix D.

2.2 Field Testing

The test borings were drilled using hollow-stem augers. The soils at the boring locations were sampled continuously using a split spoon sampler and Standard Penetration Testing (SPT) techniques. Pocket Penetrometer Tests (PPT) were performed where stiffer cohesive soils were encountered. SPT blow counts and PPT results are shown on the logs.

2.3 Laboratory Testing

The site soils were visually classified in the field and returned to our laboratory for further classification and testing. Laboratory testing included 7 moisture contents (ASTM D-2216), 5 gradation analyses (ASTM C-117 & C-136), 2 Atterberg Limits (ASTM D4318-10), 4 Moisture Density (ASTM D-1557) and 4 California Bearing Ratio (CBR, ASTM D-1883) laboratory soils tests. Additionally, we performed drilled core compression tests (ASTM C-42) on two concrete cores. The results of the laboratory testing are presented in Appendix E. The results of the moisture contents and Atterberg Limits tests are shown on the exploration logs.

3.0 SUBSURFACE CONDITIONS

3.1 Soil and Bedrock Conditions

The test borings generally encountered surficial pavement overlying base and subbase materials overlying native glaciomarine soils and glacial till mantling probable bedrock. The principal strata encountered are summarized below.

Pavement: The existing pavement conditions include bituminous pavement and bituminous pavement overlying concrete pavement sections. The explorations within the Taxiways encountered overall pavement thicknesses ranging from 15.25 to 26 inches. The explorations within the shoulders of the Taxiways encountered bituminous pavement thicknesses ranging from 2.5 to 4.875 inches. As a result of the varying sections, refer to the Pavement Core Photographs, attached as Appendix D, for more detailed pavement information.

Base and Subbase Materials: Underlying the surficial pavement, the test borings encountered base and subbase materials generally consisting of dense to very dense silty sand with varying portions of gravel and cobbles. The base and subbase materials were encountered to depths ranging from about 4 to 6.5 feet.

Glaciomarine Soils: Underlying the subbase materials, test borings B-1 and B-2 encountered native glaciomarine soils generally consisting of hard to stiff brown silty clay. Test borings B-1 and B-2 were terminated in the glaciomarine soils at depths of about 10 feet.

Glacial Till: Underlying the subbase materials, test borings B-3 and B-4 encountered glacial till consisting of dense to very dense gravelly sand and silt with occasional cobbles.

Probable Bedrock: Underlying the glacial till, test borings B-3 and B-4 encountered probable weathered bedrock at depths of about 7.5 and 7 feet, respectively. Test borings B-3 and B-4 were terminated on refusal surfaces (probable competent bedrock) at depths of about 7.8 and 8.2 feet, respectively.

Not all the strata were encountered at each exploration; refer to the attached logs for more detailed subsurface information.

3.2 Groundwater

Free water was not observed at the test borings during the exploration work. Groundwater likely becomes perched on the relatively impervious glaciomarine soils, glacial till and probable bedrock encountered at the explorations. Long term groundwater information is not available. It should be anticipated that groundwater levels will fluctuate, particularly in response to periods of snowmelt and precipitation, as well as changes in site use.

4.0 RECOMMENDATIONS AND LABORATORY TEST RESULTS

4.1 Design Frost Depth

The design freezing index for the Bangor, Maine area is approximately 1,750-Fahrenheit degree-days, which corresponds to a frost penetration depth on the order of 5 feet.

4.2 Laboratory Test Results

The results of 5 gradation analyses, 2 Atterberg Limits, 4 Moisture Density 4 CBR and 2 concrete core compression laboratory tests are presented in Appendix E.

Laboratory CBR tests were performed on auger flight soil samples obtained from test borings B-1A through B-4A. The laboratory CBR values are based on the value when compared to the dry density at 95 percent compaction of the moisture density (ASTM D-698) test results. Laboratory CBR test results are summarized below.

Location	Depth Tested	CBR Value
B-1A	3.5 to 5.5 feet	17.7
B-2A	3.5 to 5.5 feet	16.5
B-3A	3.5 to 5.5 feet	21
B-4A	4 to 6 feet	32

Additionally, concrete core compression tests were performed on cores obtained from C-2 and C-8. Laboratory compression test results are summarized below.

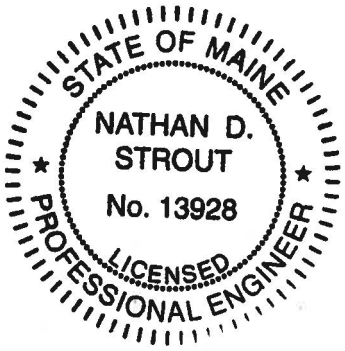
Location	Compressive Strength (psi)
C-2	3,759
C-8	4,798

5.0 CLOSURE

It has been a pleasure to be of assistance to you with this phase of your project. If you have any questions or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,

S. W. Cole Engineering, Inc.



Nathan D. Strout, P.E.
Senior Geotechnical Engineer

NDS:rec

Appendix A
Limitations

This report has been prepared for the exclusive use of Mead & Hunt for specific application to the proposed Taxiway A Reconstruction project at the Bangor International Airport in Bangor, Maine. S. W. Cole Engineering, Inc. (S.W.COLE) has endeavored to conduct our services in accordance with generally accepted soil and foundation engineering practices. No warranty, expressed or implied, is made.

The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

S.W.COLE's scope of services has not included the investigation, detection, or prevention of any Biological Pollutants at the project site or in any existing or proposed structure at the site. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S.W.COLE should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless the changes are reviewed by S.W.COLE.

APPENDIX B

Figures



N

LEGEND

- APPROXIMATE BORING LOCATION
- APPROXIMATE CORE LOCATION

NOTES:

1. EXPLORATION LOCATION PLAN WAS PREPARED FROM IMAGERY ENTITLED "ORTHOPHOTOS 2024," PROVIDED BY BANGOR GIS.

2. THE EXPLORATION LOCATIONS WERE SELECTED BY RDM INTERNATIONAL, INC. AND ESTABLISHED IN THE FIELD BY S. W. COLE ENGINEERING, INC. USING A MAPPING GRADE GPS RECEIVER.

3. THIS PLAN SHOULD BE USED IN CONJUNCTION WITH THE ASSOCIATED S. W. COLE ENGINEERING, INC. GEOTECHNICAL REPORT.

4. THE PURPOSE OF THIS PLAN IS ONLY TO DEPICT THE LOCATION OF THE EXPLORATIONS IN RELATION TO THE EXISTING CONDITIONS AND PROPOSED CONSTRUCTION AND IS NOT TO BE USED FOR CONSTRUCTION.

0 150 300 600 900 Feet

S.W.COLE ENGINEERING, INC.

MEAD & HUNT

EXPLORATION LOCATION PLAN

PROPOSED TAXIWAY A RECONSTRUCTION
BANGOR INTERNATIONAL AIRPORT
BANGOR, MAINE

Job No.	25-0600	Scale	1" = 300'
Date:	09/08/2025	Sheet	1

APPENDIX C

Exploration Logs and Key

BORING LOG

BORING NO.: B-1 (C-2)
SHEET: 1 of 1
PROJECT NO. 25-0600
DATE START: 8/25/2025
DATE FINISH: 8/25/2025

CLIENT: Mead & Hunt
PROJECT: Proposed Taxiway A Reconstruction
LOCATION: Bangor International Airport, Bangor, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** N/A **TOTAL DEPTH (FT):** 10.0 **LOGGED BY:** Alex Allen
DRILLING CO.: Seaboard Drilling, LLC **DRILLER:** Eric Baron **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Acker **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A /N/A **CORE BARREL:** N/A
HAMMER CORRECTION FACTOR: 1.5 **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): No free water observed
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
										Bituminous Pavement (19 mm)		
										0.3 Concrete (1.5 inch aggregate)		
			1D		2-4	24/14	27-34-35-34	ID 33392B w =4.2 %		1.4 Very dense, brown gravelly silty SAND, with occasional cobbles (Base/Subbase)		
			2D		4-6	24/16	22-29-31-29			4.0 Very dense, brown silty gravelly SAND with occasional cobbles (Subbase/Fill)		
	5		3D		6-8	24/10	23-12-11-12			6.5 Stiff, brown clayey SILT, some sand		
			4D		8-10	24/24	8-8-10-10	q_P=3-4 ksf ID 33397B w =22.7 % W_L=34 W_P=20				
	10									Bottom of Exploration at 10.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING / WELL 10-12-2022 25-0600.GPJ SWCE TEMPLATE.GDT 10/1/25

BORING LOG

BORING NO.: B-2 (C-5)
SHEET: 1 of 1
PROJECT NO. 25-0600
DATE START: 8/25/2025
DATE FINISH: 8/25/2025

CLIENT: Mead & Hunt
PROJECT: Proposed Taxiway A Reconstruction
LOCATION: Bangor International Airport, Bangor, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** N/A **TOTAL DEPTH (FT):** 10.0 **LOGGED BY:** Alex Allen
DRILLING CO.: Seaboard Drilling, LLC **DRILLER:** Eric Baron **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Acker **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A /N/A **CORE BARREL:** N/A
HAMMER CORRECTION FACTOR: 1.5 **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): No free water observed
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_2O Depth	Remarks
										Bituminous Pavement (19 mm)		
										0.4 Concrete (1.5 inch aggregate)		
			1D		2-4	24/16	11-18-32-29	ID 33393B w =7.1 %		1.6 Dense to very dense, brown gravelly silty SAND, with occasional cobbles (Base/Subbase)		
			2D		4-6	24/12	33-18-15-16					
	5							q_P=9+ ksf ID 33398B w =18.4 % W_L=31 W_P=18		4.5 Hard to very stiff, brown clayey silt, some sand		
			3D		6-8	24/16	10-12-13-15	q_P=9+ ksf				
			4D		8-10	24/24	8-9-8-9	q_P=4-5 ksf				
	10									Bottom of Exploration at 10.0 feet		

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING / WELL 10-12-2022 25-0600.GPJ SWCE TEMPLATE.GDT 10/1/25

BORING LOG

BORING NO.: B-3 (C-9)
SHEET: 1 of 1
PROJECT NO. 25-0600
DATE START: 8/26/2026
DATE FINISH: 8/26/2026

CLIENT: Mead & Hunt
PROJECT: Proposed Taxiway A Reconstruction
LOCATION: Bangor International Airport, Bangor, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** N/A **TOTAL DEPTH (FT):** 7.8 **LOGGED BY:** Alex Allen
DRILLING CO.: Seaboard Drilling, LLC **DRILLER:** Eric Baron **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Acker **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A /N/A **CORE BARREL:** N/A
HAMMER CORRECTION FACTOR: 1.5 **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): No free water observed
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
										Bituminous Pavement (19 mm)		
										0.5 Concrete (1.5 inch aggregate)		
			1D		2.2-4.2	24/14	6-19-15-25	ID 33394B w =5.7 %		2.2 Dense to very dense, brown silty SAND, trace gravel (Base/Subbase)		
			2D		4.2-6.2	24/24	25-29-37-60			... becoming gravelly		
	5									5.2 Very dense, brown silty gravelly SAND with occasional cobbles (Glacial Till)		
			3D		6.2-7.8	19/19	51-46-53-75/1"					
									///	7.5 Probable weathered Bedrock		

Refusal at 7.8 feet
(Probable Bedrock)

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING NO.: B-3 (C-9)

BORING LOG

BORING NO.: B-4 (C-13)
SHEET: 1 of 1
PROJECT NO. 25-0600
DATE START: 8/26/2026
DATE FINISH: 8/26/2026

CLIENT: Mead & Hunt
PROJECT: Proposed Taxiway A Reconstruction
LOCATION: Bangor International Airport, Bangor, Maine

Drilling Information

LOCATION: See Exploration Location Plan **ELEVATION (FT):** N/A **TOTAL DEPTH (FT):** 8.2 **LOGGED BY:** Alex Allen
DRILLING CO.: Seaboard Drilling, LLC **DRILLER:** Eric Baron **DRILLING METHOD:** Hollow Stem Auger
RIG TYPE: Truck Mounted Acker **AUGER ID/OD:** 2 1/4 in / 5 5/8 in **SAMPLER:** Standard Split-Spoon
HAMMER TYPE: Automatic **HAMMER WEIGHT (lbs):** 140 **CASING ID/OD:** N/A /N/A **CORE BARREL:** N/A
HAMMER CORRECTION FACTOR: 1.5 **HAMMER DROP (inch):** 30
WATER LEVEL DEPTHS (ft): No free water observed
GENERAL NOTES:

KEY TO NOTES AND SYMBOLS:
Water Level: ▽ At time of Drilling; ▼ At Completion of Drilling; ▼ After Drilling
D = Split Spoon Sample; U = Thin Walled Tube Sample; R = Rock Core Sample; V = Field Vane Shear
Pen. = Penetration Length; Rec. = Recovery Length; bpf = Blows per Foot; mpf = Minute per Foot
WOR = Weight of Rods; WOH = Weight of Hammer; RQD = Rock Quality Designation; PID = Photoionization Detector
S_v = Field Vane Shear Strength, kips/sq.ft.; q_u = Unconfined Compressive Strength, kips/sq.ft.; Ø = Friction Angle (Estimated); N/A = Not Applicable

Elev. (ft)	Depth (ft)	Casing Pen. (bpf)	SAMPLE INFORMATION: Sample No.	Type	Depth (ft)	Pen./ Rec. (in)	Blow Count or RQD	Field / Lab Test Data	Graphic Log	Sample Description & Classification	H_20 Depth	Remarks
										Bituminous Pavement (19 mm)		
			1D		1.6-3.6	24/16	18-25-30-31	ID 33395B w =6.6 %		1.6 Dense, brown SAND and GRAVEL, some silt with occasional cobbles (Base)		
								ID 33396B w =11.2 %		2.4 Very dense, brown silty SAND, trace gravel (Subbase)		
			2D		4-6	24/12	12-34-26-50			4.0 Dense to very dense, brown gravelly SAND and SILT with occasional cobbles (Glacial Till)		
	5											
			3D		6-7.7	20/14	19-22-58-50/2"					
										7.0 Probable weathered Bedrock		

Refusal at 8.2 feet
(Probable Bedrock)

Stratification lines represent approximate boundary between soil types, transitions may be gradual. Water level readings have been made at times and under conditions stated. Fluctuations of groundwater may occur due to other factors than those present at the time measurements were made.

BORING / WELL 10-12-2022 25-0600.GPJ SWCE TEMPLATE.GDT 10/1/25

S.W.COLE ENGINEERING, INC.

KEY TO THE NOTES & SYMBOLS
Test Boring and Test Pit Explorations

All stratification lines represent the approximate boundary between soil types and the transition may be gradual.

Key to Symbols Used:

w	-	water content, percent (dry weight basis)
q_u	-	unconfined compressive strength, kips/sq. ft. - laboratory test
S_v	-	field vane shear strength, kips/sq. ft.
L_v	-	lab vane shear strength, kips/sq. ft.
q_p	-	unconfined compressive strength, kips/sq. ft. – pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W_L	-	liquid limit - Atterberg test
W_P	-	plastic limit - Atterberg test
WOH	-	advance by weight of hammer
WOM	-	advance by weight of man
WOR	-	advance by weight of rods
HYD	-	advance by force of hydraulic piston on drill
RQD	-	Rock Quality Designator - an index of the quality of a rock mass.
γ_T	-	total soil weight
γ_B	-	buoyant soil weight

Description of Proportions:

Trace:	0 to 5%
Some:	5 to 12%
"Y"	12 to 35%
And	35+%
With	Undifferentiated

Description of Stratified Soils

Parting:	0 to 1/16" thickness
Seam:	1/16" to ½" thickness
Layer:	½" to 12" thickness
Varved:	Alternating seams or layers
Occasional:	one or less per foot of thickness
Frequent:	more than one per foot of thickness

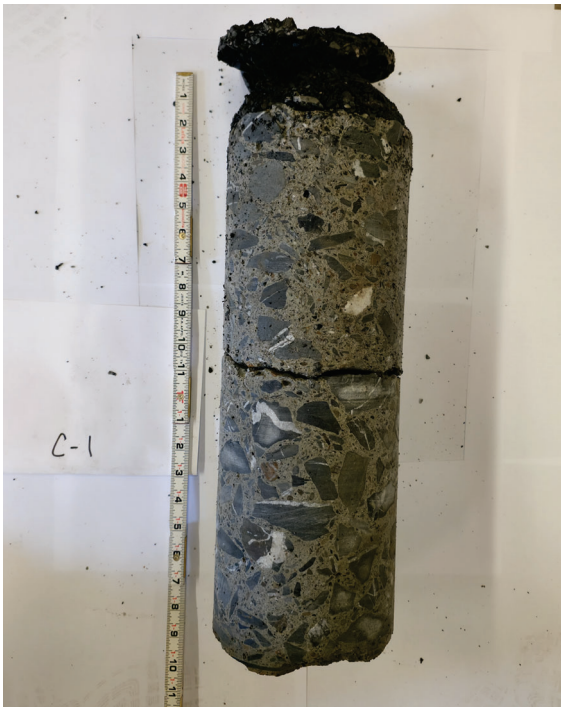
REFUSAL: **Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

REFUSAL: **Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.

APPENDIX D

Pavement Core Photographs



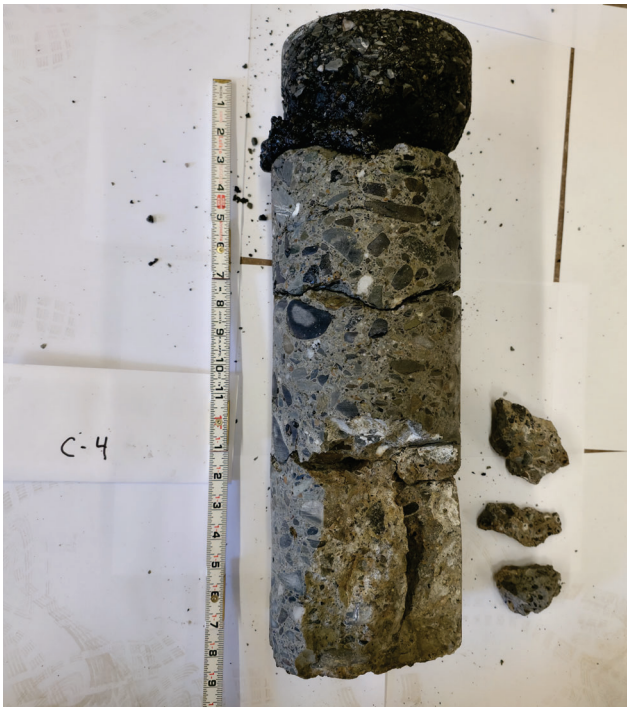
C-1 - Total thickness of 19 inches
2.5 inches of HMA (19 mm) over 16.5 inches of concrete (1.5 inch aggregate)



C-2 - Total thickness of 16.25 inches
2.75 inches of HMA (19 mm) over 13.5 inches of concrete (1.5 inch aggregate)



C-3 - Total thickness of 15.25 inches
2.75 inches over 3.5 inches over 4.25 inches over 4.75 inches of HMA (19 mm)



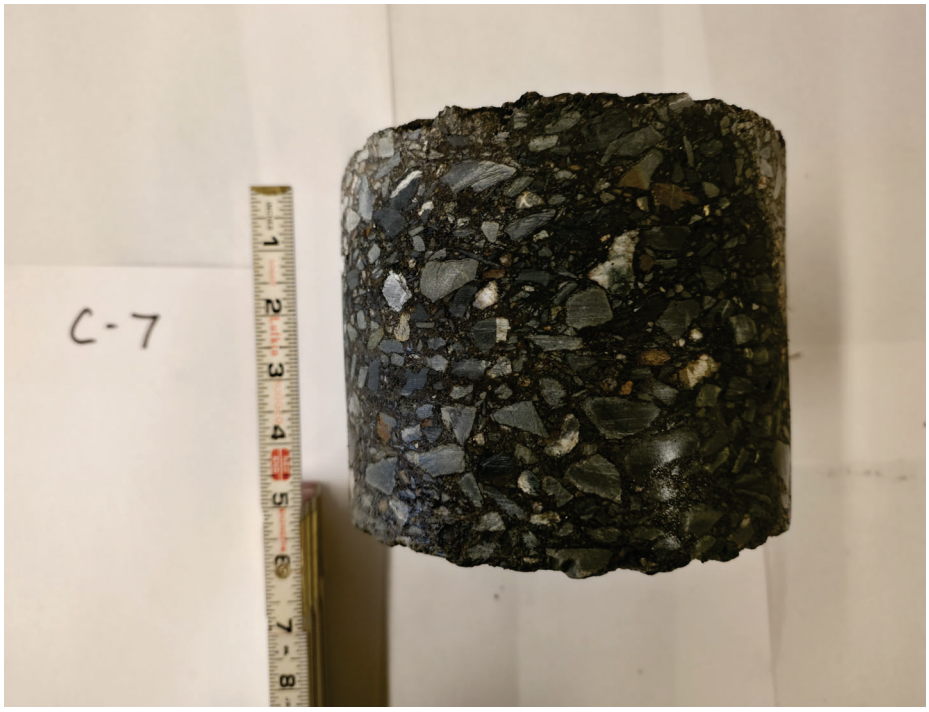
C-4 - Total thickness of 18.5 inches
3.25 inches of HMA (19 mm) over 15.25 inches of concrete (1.5 inch aggregate)



C-5 - Total thickness of 19.5 inches
5 inches of HMA (19 mm) over 14.5 inches of concrete (1.5 inch aggregate)



C-6 - Total thickness of 3.875 inches
3.875 inches of HMA (19 mm)



C-7 - Total thickness of 4.875 inches
4.875 inches of HMA (19 mm)



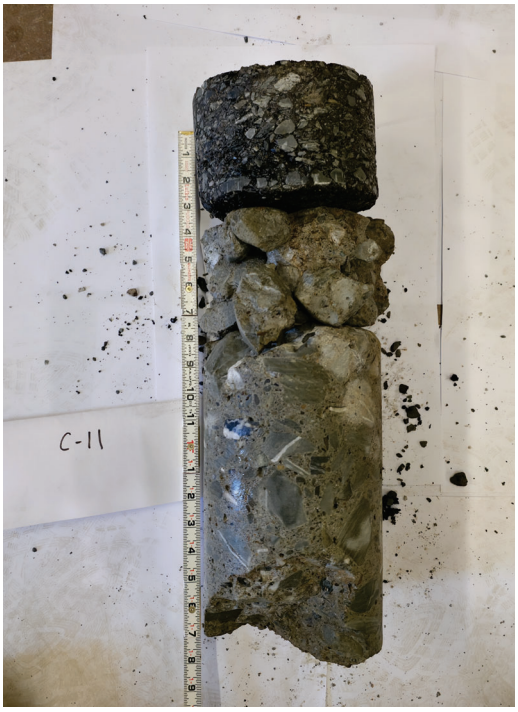
C-8 - Total thickness of 22.5 inches
5.5 inches of HMA (19 mm) over 17 inches of concrete (1.5 inch aggregate)



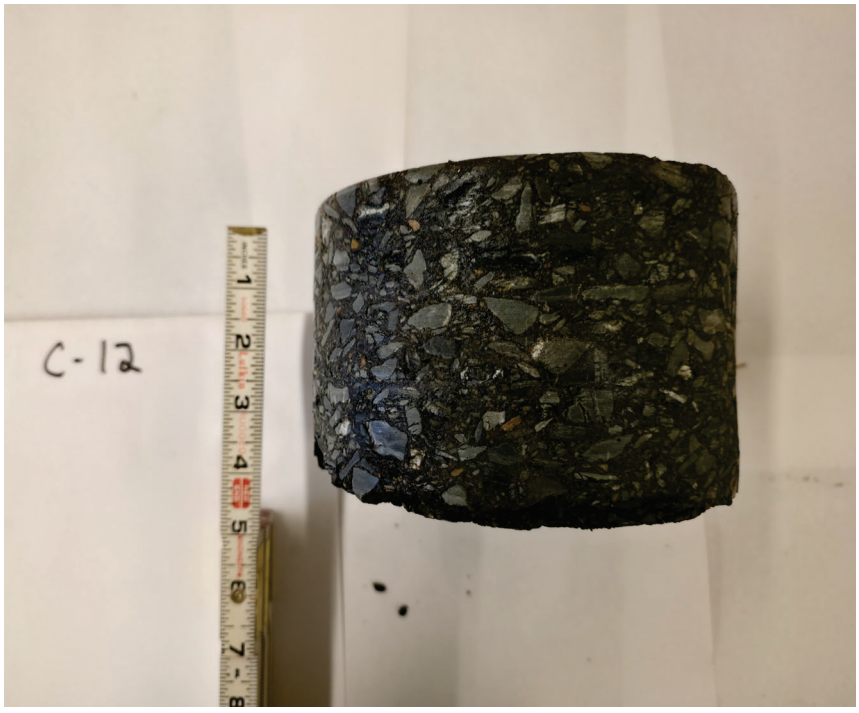
C-9 - Total thickness of 26 inches
5.5 inches of HMA (19 mm) over 20.5 inches of concrete (1.5 inch aggregate)



C-10 - Total thickness of 3 inches
3 inches of HMA (19 mm)



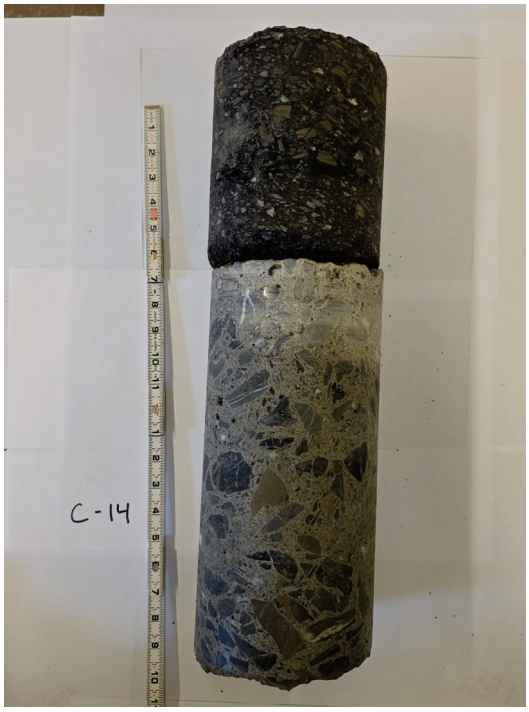
C-11 - Total thickness of 17.75 inches
3.75 inches of HMA (19 mm) over 14 inches of concrete (1.5 inch aggregate)



C-12 - Total thickness of 4.125 inches
4.125 inches of HMA (19 mm)



C-13 - Total thickness of 19 inches
3.5 inches over 3 inches +/- over 6 inches over 6.5 inches of HMA (19 mm)



C-14 - Total thickness of 19.875 inches
4.5 inches of HMA (19 mm) over 2.375 inches of HMA (12.5 mm) over 13 inches of concrete (1.5 inch aggregate). Note; .5 inch diameter reinforcing observed at depth of 1 inch from top of concrete



C-15 - Total thickness of 2.5 inches
2.5 inches of HMA (19 mm)



C-16 - Total thickness of 24.125 inches
4.25 inches of HMA (19 mm) over 2.75 inches of HMA (12.5 mm) over 17.125 inches of concrete (1.5 inch aggregate). Note; .5 inch diameter reinforcing observed at depth of 10.5 inches from top of concrete



C-17 - Total thickness of 17.75 inches
4.5 inches of HMA (19 mm) over 13.25 inches of concrete (1.5 inch aggregate)



C-18 - Total thickness of 3.125 inches
3.125 inches of HMA (19 mm)

APPENDIX E

Laboratory Test Results

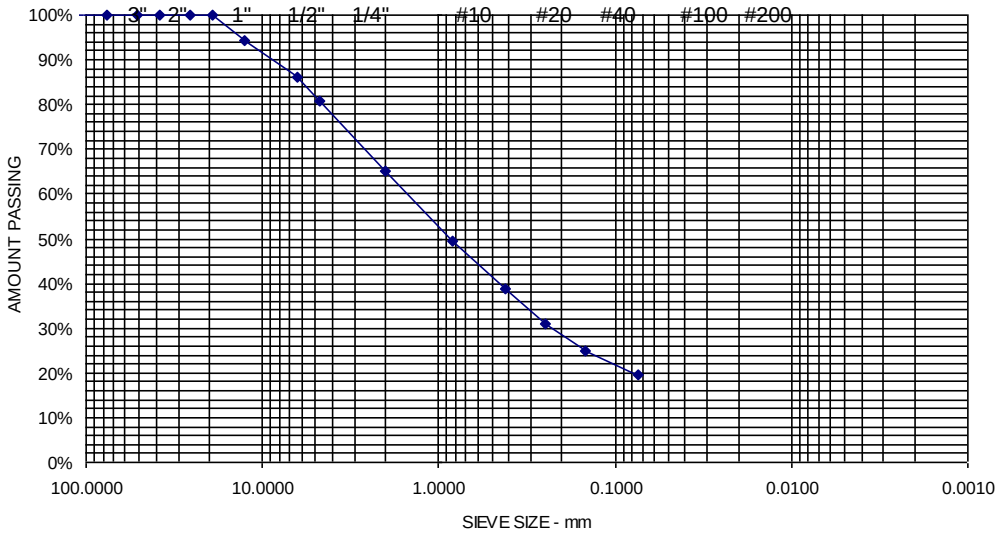
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	BANGOR ME - BIA TAXIWAY A RECONSTRUCTION - EXPLORATIONS AND LABORATORY TESTING SERVICES	Project Number	25-0600
Client	MEAD AND HUNT, INC.	Lab ID	33392B
Exploration	**1D**	Date Received	9/3/2025
Material Source	**B-1 (C-2), 2-4 FEET**	Date Completed	9/5/2025
		Tested By	CHRISTOPHER RAYMOND

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150	**6"**	**100**	
125	**5"**	**100**	
100	**4"**	**100**	
75	**3"**	**100**	
50	**2"**	**100**	
38.1	**1-1/2"**	**100**	
25.0	**1"**	**100**	
19.0	**3/4"**	**100**	
12.5	**1/2"**	**94**	
6.3	**1/4"**	**86**	
4.75	**No. 4**	**81**	19.2% Gravel
2.00	**No. 10**	**65**	
850	**No. 20**	**49**	
425	**No. 40**	**39**	61.3% Sand
250	**No. 60**	**31**	
150	**No. 100**	**25**	
75	**No. 200**	**19.4**	19.4% Fines



Comments:

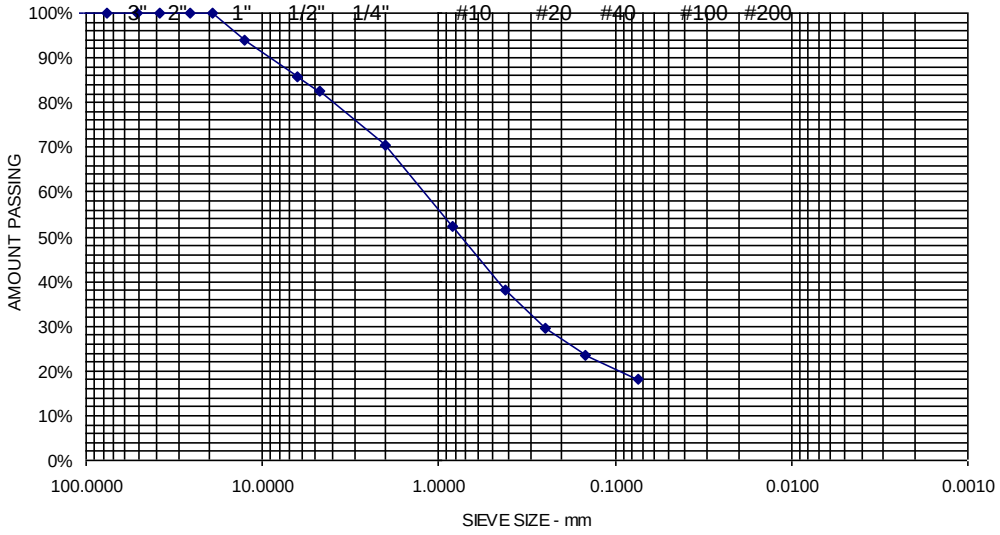
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	BANGOR ME - BIA TAXIWAY A RECONSTRUCTION - EXPLORATIONS AND LABORATORY TESTING SERVICES	Project Number	25-0600
Client	MEAD AND HUNT, INC.	Lab ID	33393B
Exploration	**1D**	Date Received	9/3/2025
Material Source	**B-2 (C-5), 2-4 FEET**	Date Completed	9/5/2025
		Tested By	THOMAS HIGGINS

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150	**6"**	**100**	
125	**5"**	**100**	
100	**4"**	**100**	
75	**3"**	**100**	
50	**2"**	**100**	
38.1	**1-1/2"**	**100**	
25.0	**1"**	**100**	
19.0	**3/4"**	**100**	
12.5	**1/2"**	**94**	
6.3	**1/4"**	**86**	
4.75	**No. 4**	**82**	17.6% Gravel
2.00	**No. 10**	**70**	
850	**No. 20**	**52**	
425	**No. 40**	**38**	64.3% Sand
250	**No. 60**	**30**	
150	**No. 100**	**23**	
75	**No. 200**	**18.2**	18.2% Fines



Comments:

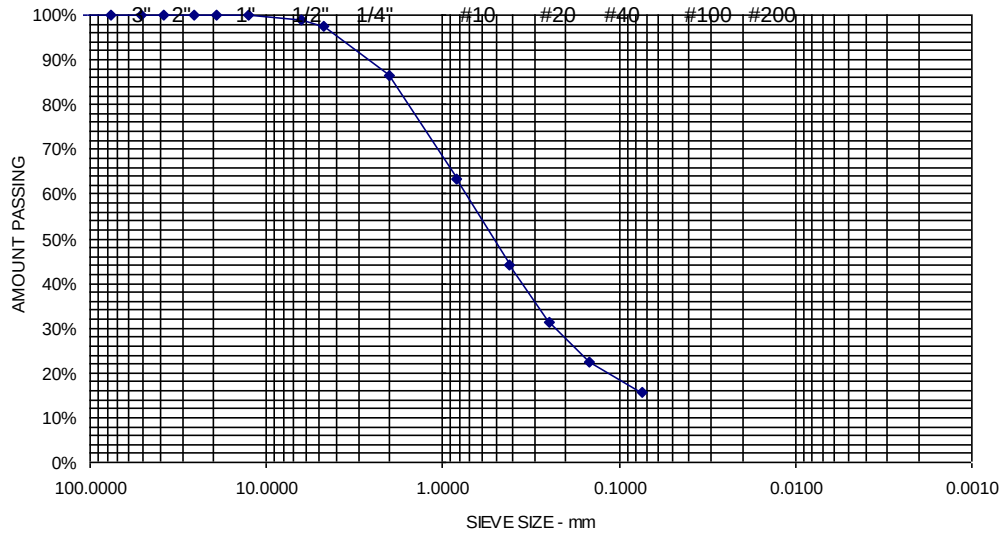
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	BANGOR ME - BIA TAXIWAY A RECONSTRUCTION - EXPLORATIONS AND LABORATORY TESTING SERVICES	Project Number	25-0600
Client	MEAD AND HUNT, INC.	Lab ID	33394B
Exploration	**1D**	Date Received	9/3/2025
Material Source	**B-3 (C-9), 2.2-4.2 FEET**	Date Completed	9/5/2025
		Tested By	THOMAS HIGGINS

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150	**6"**	**100**	
125	**5"**	**100**	
100	**4"**	**100**	
75	**3"**	**100**	
50	**2"**	**100**	
38.1	**1-1/2"**	**100**	
25.0	**1"**	**100**	
19.0	**3/4"**	**100**	
12.5	**1/2"**	**100**	
6.3	**1/4"**	**99**	
4.75	**No. 4**	**97**	2.6% Gravel
2.00	**No. 10**	**87**	
850	**No. 20**	**63**	
425	**No. 40**	**44**	81.9% Sand
250	**No. 60**	**31**	
150	**No. 100**	**22**	
75	**No. 200**	**15.5**	15.5% Fines



Comments:

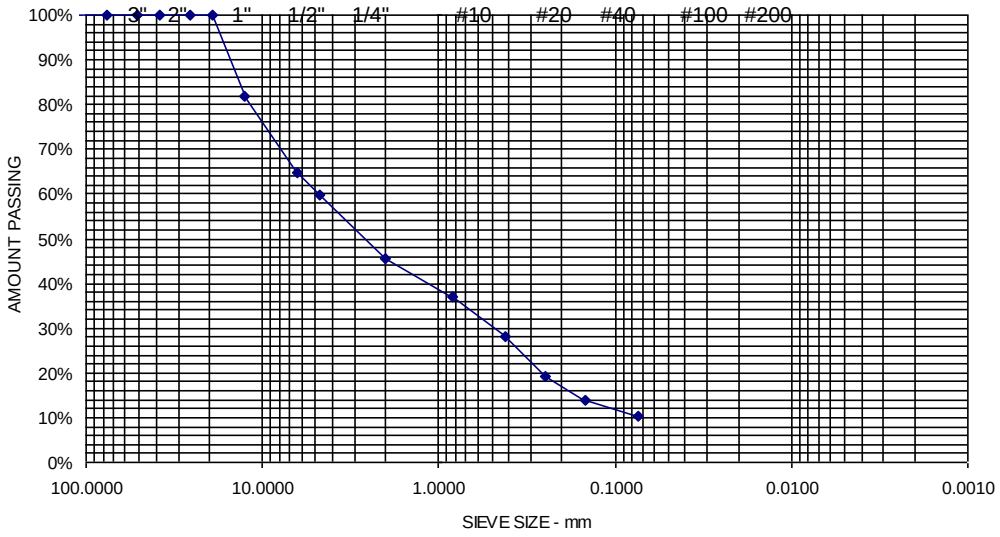
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	BANGOR ME - BIA TAXIWAY A RECONSTRUCTION - EXPLORATIONS AND LABORATORY TESTING SERVICES	Project Number	25-0600
Client	MEAD AND HUNT, INC.	Lab ID	33395B
Exploration	**1D-A**	Date Received	9/3/2025
Material Source	**B-4 (C-13), 1.6-2.4 FEET**	Date Completed	9/5/2025
		Tested By	CHRISTOPHER RAYMOND

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150	**6"**	**100**	
125	**5"**	**100**	
100	**4"**	**100**	
75	**3"**	**100**	
50	**2"**	**100**	
38.1	**1-1/2"**	**100**	
25.0	**1"**	**100**	
19.0	**3/4"**	**100**	
12.5	**1/2"**	**82**	
6.3	**1/4"**	**65**	
4.75	**No. 4**	**60**	40.2% Gravel
2.00	**No. 10**	**46**	
850	**No. 20**	**37**	
425	**No. 40**	**28**	49.4% Sand
250	**No. 60**	**19**	
150	**No. 100**	**14**	
75	**No. 200**	**10.4**	10.4% Fines



Comments:

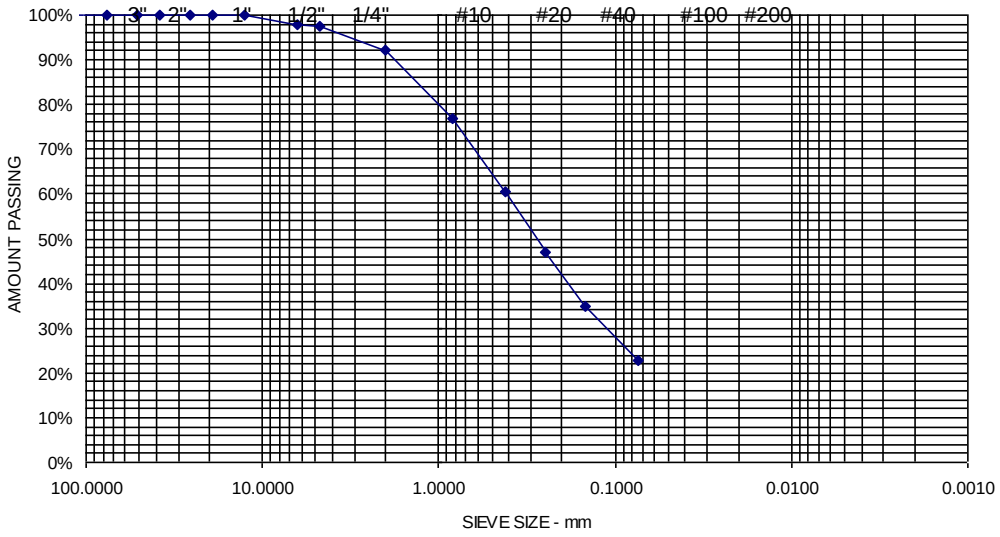
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	BANGOR ME - BIA TAXIWAY A RECONSTRUCTION - EXPLORATIONS AND LABORATORY TESTING SERVICES	Project Number	25-0600
Client	MEAD AND HUNT, INC.	Lab ID	33396B
Exploration	**1D-B**	Date Received	9/3/2025
Material Source	**B-4 (C-13), 2.4-3.6 FEET**	Date Completed	9/5/2025
		Tested By	CHRISTOPHER RAYMOND

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150	**6"**	**100**	
125	**5"**	**100**	
100	**4"**	**100**	
75	**3"**	**100**	
50	**2"**	**100**	
38.1	**1-1/2"**	**100**	
25.0	**1"**	**100**	
19.0	**3/4"**	**100**	
12.5	**1/2"**	**100**	
6.3	**1/4"**	**98**	
4.75	**No. 4**	**97**	2.6% Gravel
2.00	**No. 10**	**92**	
850	**No. 20**	**77**	
425	**No. 40**	**61**	74.8% Sand
250	**No. 60**	**47**	
150	**No. 100**	**35**	
75	**No. 200**	**22.6**	22.6% Fines



Comments:

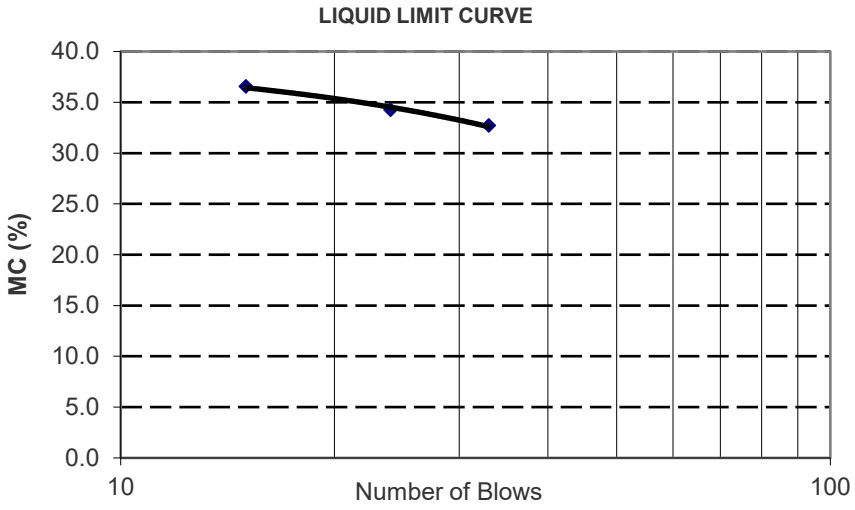
S.W.COLE ENGINEERING, INC.

Report of Atterberg Limits

ASTM D4318-10 - Method A

Project Name:	BIA Taxiway A Reconstruction	**Project Number:**	25-0600
Project Location:	Bangor, ME	**Lab ID:**	33397B
Client:	Mead and Hunt, Inc.	**Date Received:**	09/03/25
Material Description:	Test Boring Sample	**Date Completed:**	09/17/25
Material Source:	B-1(C-2), 4D, 8-10 feet	**Tested By:**	DM

Liquid Limit	**34**
Plastic Limit	**20**
Plasticity Index	**14**



Material Retained On the No. 40 Sieve:	1%
As-received Moisture Content:	23%

Comments:

Reviewed By: Tom Higgins

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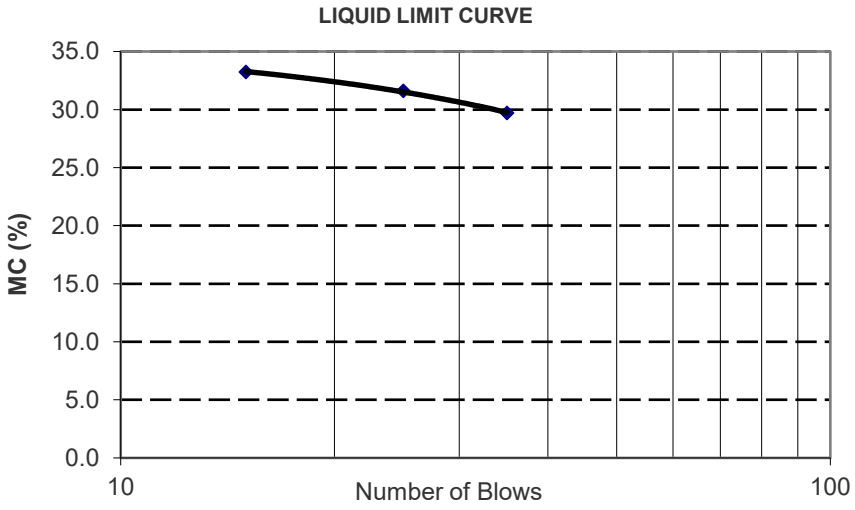
S.W.COLE ENGINEERING, INC.

Report of Atterberg Limits

ASTM D4318-10 - Method A

Project Name:	BIA Taxiway A Reconstruction	**Project Number:**	25-0600
Project Location:	Bangor, ME	**Lab ID:**	33398B
Client:	Mead and Hunt, Inc.	**Date Received:**	09/03/25
Material Description:	Test Boring Sample	**Date Completed:**	09/17/25
Material Source:	B-2 (C-5), 2D, 4.5-6 feet	**Tested By:**	DM

Liquid Limit	**31**
Plastic Limit	**18**
Plasticity Index	**13**



Material Retained On the No. 40 Sieve:	1%
As-received Moisture Content:	18%

Comments:

Reviewed By: Tom Higgins

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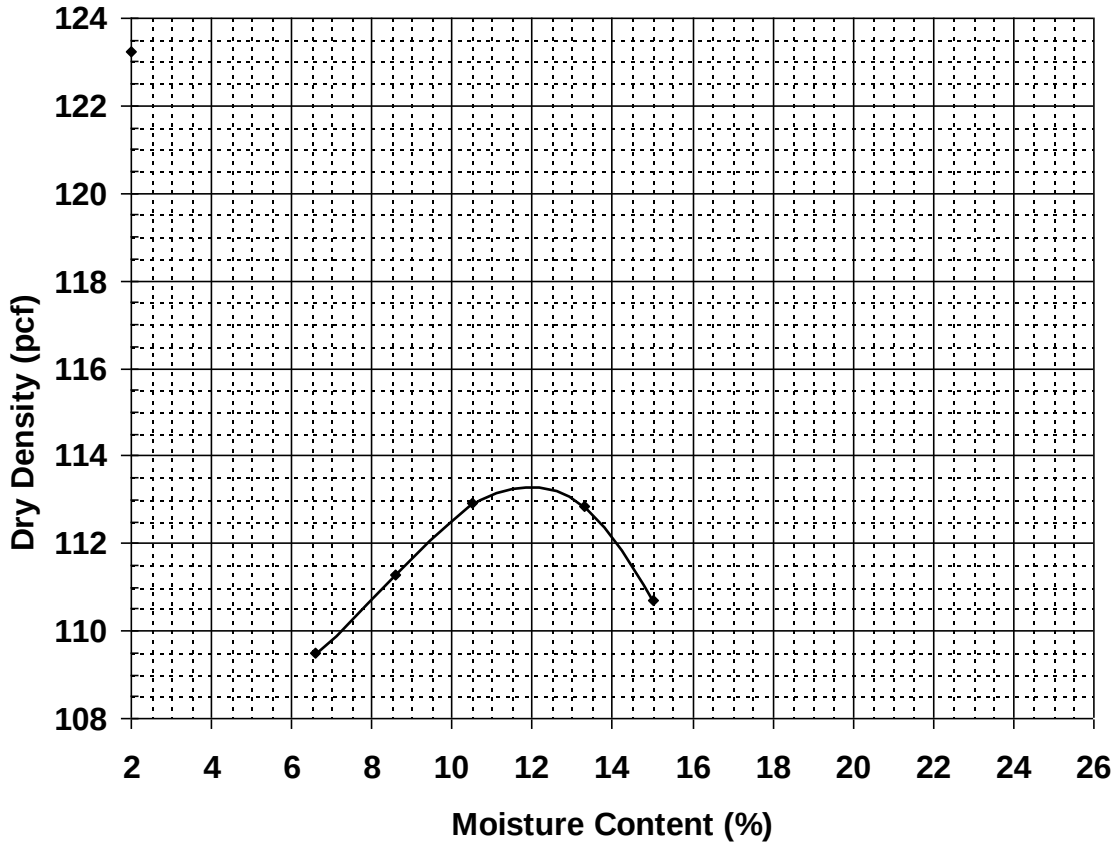
S.W.COLE ENGINEERING, INC.

Report of Moisture-Density

Method ASTM D-698 STANDARD Procedure C

Project Name	BANGOR ME - BIA TAXIWAY A RECONSTRUCTION - EXPLORATIONS AND LABORATORY TESTING SERVICES	Project Number	25-0600
Client	MEAD AND HUNT, INC.	Lab ID	33372B
Material Type	AUGER FLIGHT SAMPLE	Date Received	8/27/2025
Material Source	B-1A, 3.5-5.5 feet +/-	Date Completed	9/4/2025
		Tested By	LOGAN HENDERSON

Moisture-Density Relationship Curve



Maximum Dry Density (pcf)	113.2
Optimum Moisture Content (%)	11.9
Percent Oversized	0.0%

Corrected Dry Density (pcf)	**113.2**
Corrected Moisture Content (%)	**11.9**

Tom Higgins

Comments

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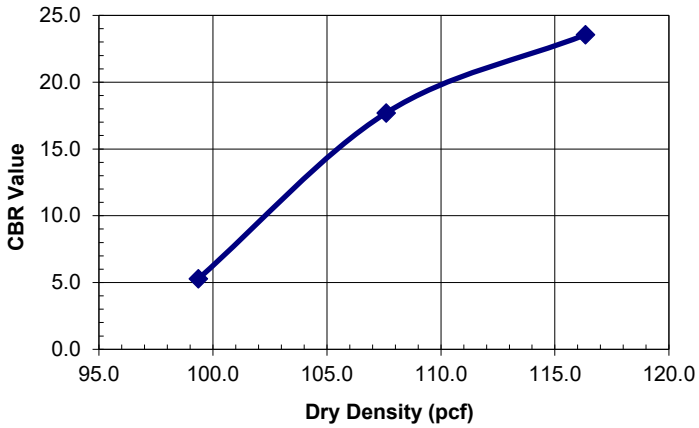
S.W.COLE ENGINEERING, INC.

Report of California Bearing Ratio

ASTM D1883-07

Project Name:	BIA Taxiway A Reconstruction	**Project Number:**	25-0600
Project Location:	Bangor, ME	**Lab ID:**	33372B
Client:	Mead and Hunt, Inc.	**Date Received:**	08/27/25
Material Description:	Auger Flight Sample	**Date Completed:**	09/30/25
Material Source:	B-1A, 3.5-5.5 feet +/-	**Tested By:**	AC

CBR Value at 95% Compaction: 17.7



Moisture Content as Compacted:	11.9%
Dry Density at 95% Compaction:	107.5 pcf
ASTM Test Method Used:	D698
Surcharge Weight:	15 lbs
Condition of Sample:	Unsoaked
Moisture Content of Top 1 inch:	11.9%
Swell (% of initial height):	Test Not Performed
Material Retained on ¾" sieve:	No Material Retained

Comments:

Reviewed By: Tom Higgins

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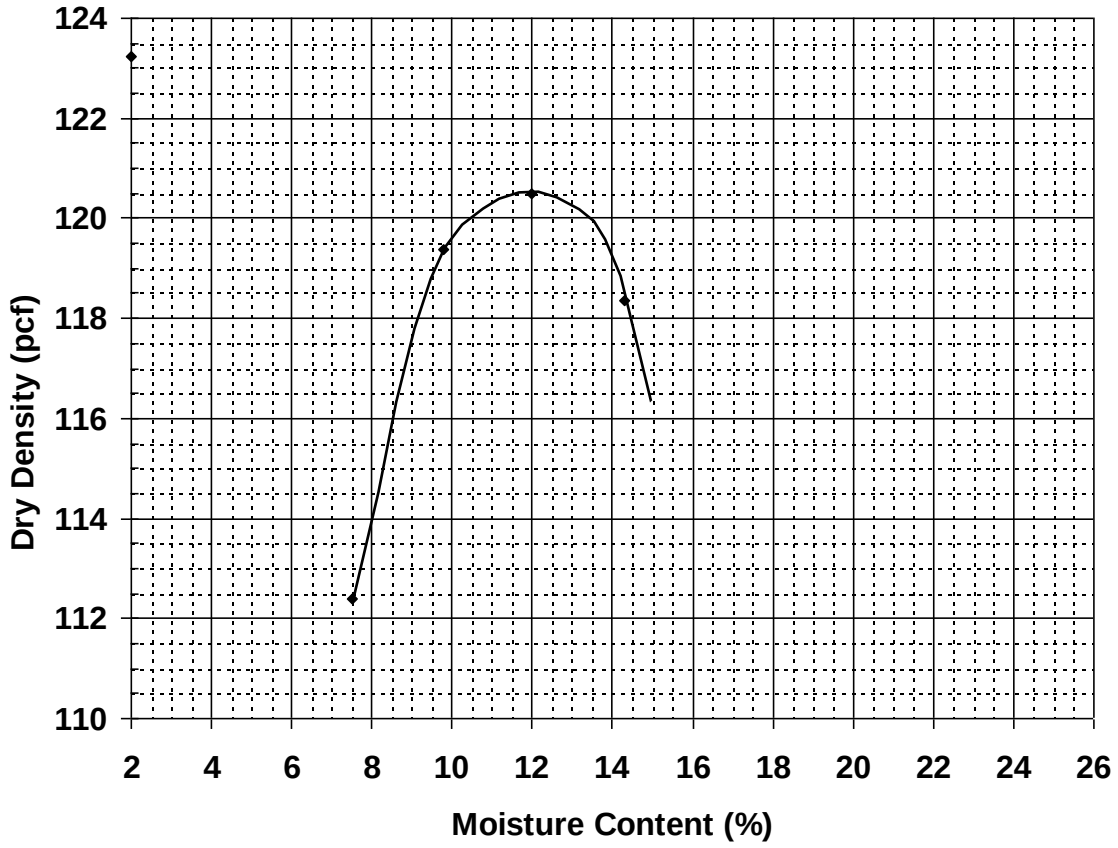
S.W.COLE ENGINEERING, INC.

Report of Moisture-Density

Method ASTM D-698 STANDARD Procedure C

Project Name	BANGOR ME - BIA TAXIWAY A RECONSTRUCTION - EXPLORATIONS AND LABORATORY TESTING SERVICES	Project Number	25-0600
Client	MEAD AND HUNT, INC.	Lab ID	33373B
Material Type	AUGER FLIGHT SAMPLE	Date Received	8/27/2025
Material Source	B-2A, 3.5-5.5 FEET +/-	Date Completed	9/12/2025
		Tested By	JULES MUYAMBI

Moisture-Density Relationship Curve



Maximum Dry Density (pcf)	120.5
Optimum Moisture Content (%)	11.9
Percent Oversized	0.0%

Corrected Dry Density (pcf)	**120.5**
Corrected Moisture Content (%)	**11.9**

Tom Higgins

Comments

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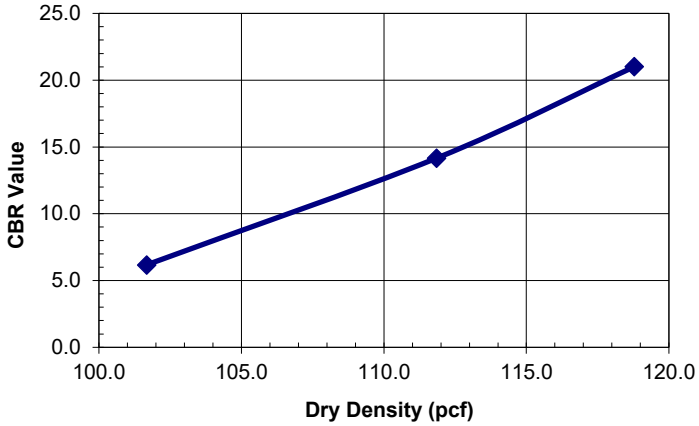
S.W.COLE ENGINEERING, INC.

Report of California Bearing Ratio

ASTM D1883-07

Project Name:	BIA Taxiway A Reconstruction	**Project Number:**	25-0600
Project Location:	Bangor, ME	**Lab ID:**	33373B
Client:	Mead and Hunt, Inc.	**Date Received:**	08/27/25
Material Description:	Auger Flight Sample	**Date Completed:**	09/26/25
Material Source:	B-2A, 3.5-5.5 feet +/-	**Tested By:**	AA

CBR Value at 95% Compaction: 16.5



Moisture Content as Compacted:	11.9%
Dry Density at 95% Compaction:	114.5 pcf
ASTM Test Method Used:	D698
Surcharge Weight:	15 lbs
Condition of Sample:	Unsoaked
Moisture Content of Top 1 inch:	11.9%
Swell (% of initial height):	Test Not Performed
Material Retained on ¾" sieve:	No Material Retained

Comments:

Reviewed By: Tom Higgins

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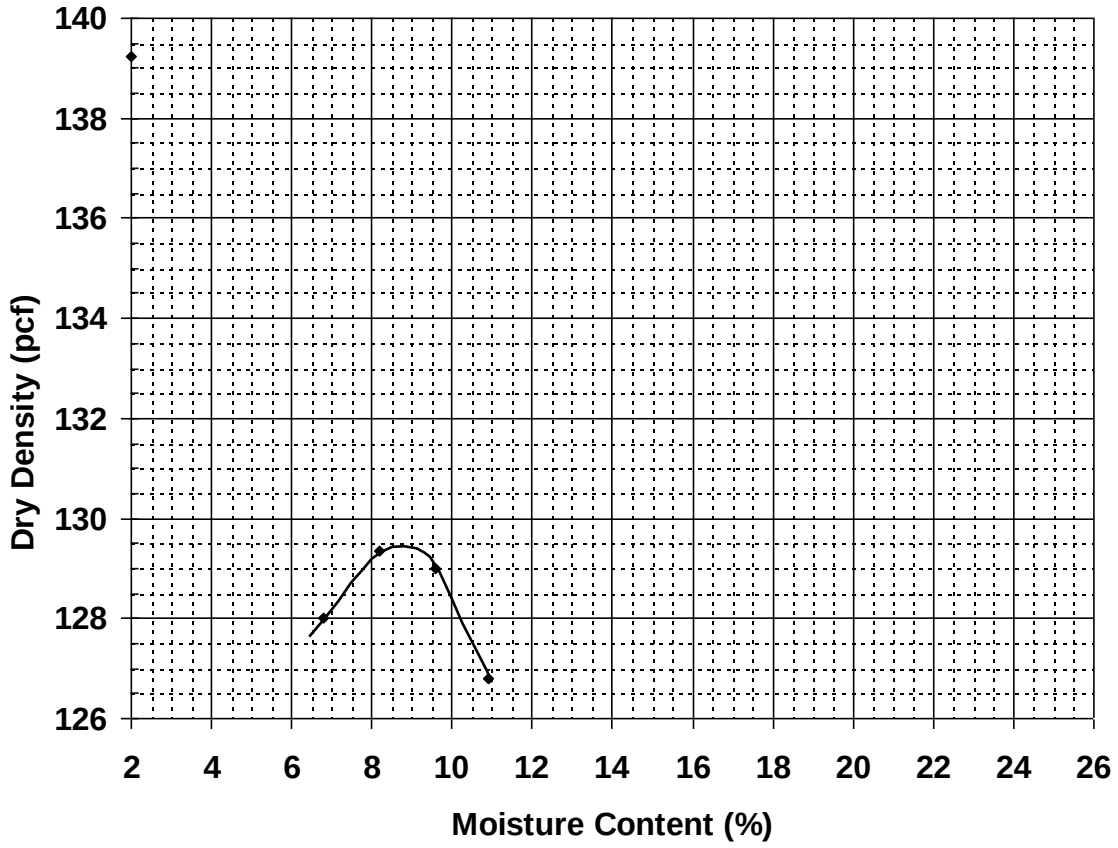
S.W.COLE ENGINEERING, INC.

Report of Moisture-Density

Method ASTM D-698 STANDARD Procedure C

Project Name	BANGOR ME - BIA TAXIWAY A RECONSTRUCTION - EXPLORATIONS AND LABORATORY TESTING SERVICES	Project Number	25-0600
Client	MEAD AND HUNT, INC.	Lab ID	33374B
Material Type	AUGER FLIGHT SAMPLE	Date Received	8/27/2025
Material Source	B-3A, 3.5-5.5 FEET +/-	Date Completed	9/2/2025
		Tested By	DEAN MALLETT

Moisture-Density Relationship Curve



Maximum Dry Density (pcf)	129.4
Optimum Moisture Content (%)	8.7
Percent Oversized	0.4%

Corrected Dry Density (pcf)	**129.5**
Corrected Moisture Content (%)	**8.7**

Tom Higgins

Comments

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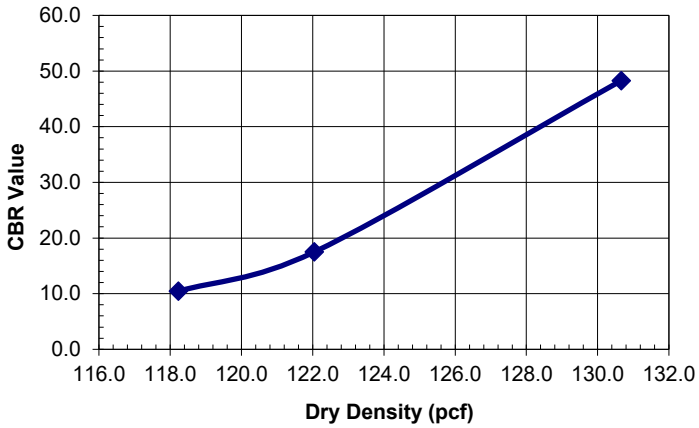
S.W.COLE ENGINEERING, INC.

Report of California Bearing Ratio

ASTM D1883-07

Project Name:	BIA Taxiway A Reconstruction	**Project Number:**	25-0600
Project Location:	Bangor, ME	**Lab ID:**	33374B
Client:	Mead and Hunt, Inc.	**Date Received:**	08/27/25
Material Description:	Auger Flight Sample	**Date Completed:**	09/26/25
Material Source:	B-3A, 3.5-5.5 feet +/-	**Tested By:**	AC

CBR Value at 95% Compaction: 21.0



Moisture Content as Compacted:	8.7%
Dry Density at 95% Compaction:	123.0 pcf
ASTM Test Method Used:	D698
Surcharge Weight:	15 lbs
Condition of Sample:	Unsoaked
Moisture Content of Top 1 inch:	8.7%
Swell (% of initial height):	Test Not Performed
Material Retained on ¾" sieve:	0.4%

Comments:

Reviewed By: Tom Higgins

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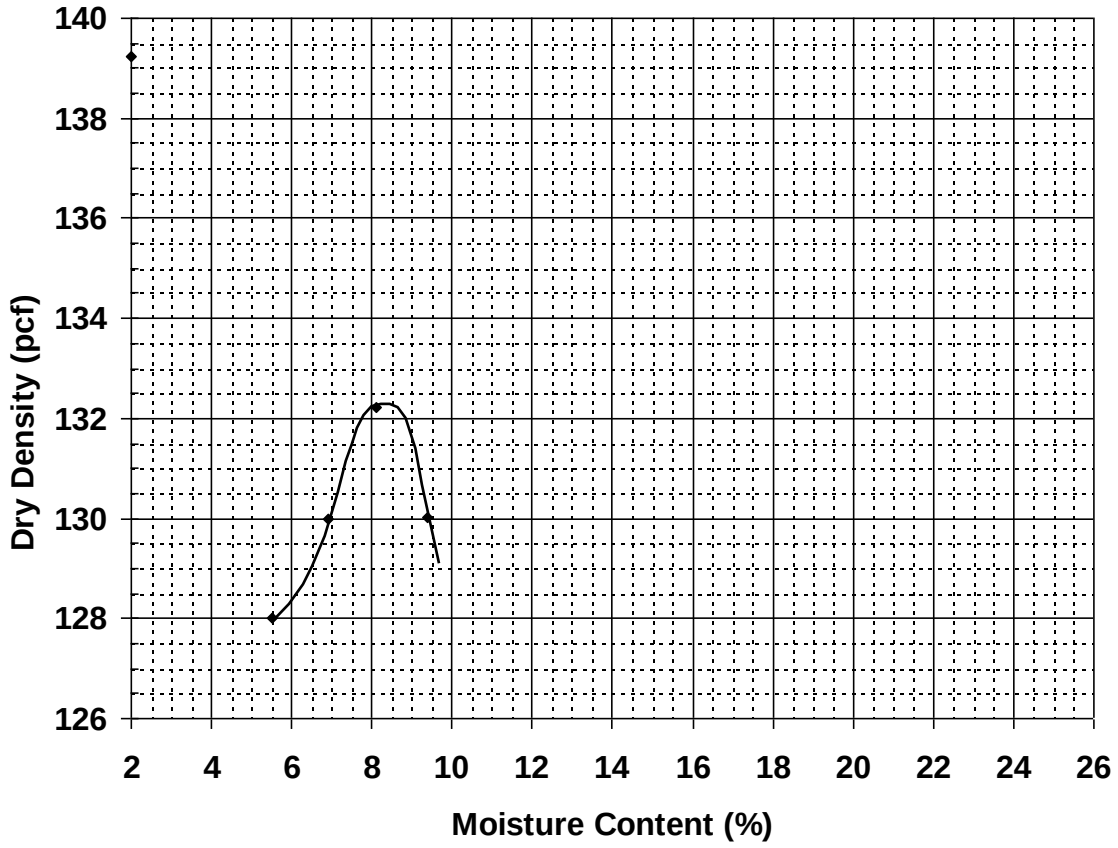
S.W.COLE ENGINEERING, INC.

Report of Moisture-Density

Method ASTM D-698 STANDARD Procedure C

Project Name	BANGOR ME - BIA TAXIWAY A RECONSTRUCTION - EXPLORATIONS AND LABORATORY TESTING SERVICES	Project Number	25-0600
Client	MEAD AND HUNT, INC.	Lab ID	33375B
Material Type	AUGER FLIGHT SAMPLE	Date Received	8/27/2025
Material Source	B-4A, 4-6 feet +/-	Date Completed	9/2/2025
		Tested By	LOGAN HENDERSON

Moisture-Density Relationship Curve



Maximum Dry Density (pcf)	132.2
Optimum Moisture Content (%)	8.25
Percent Oversized	5.1%

Corrected Dry Density (pcf)	**133.3**
Corrected Moisture Content (%)	**7.9**

Tom Higgins

Comments

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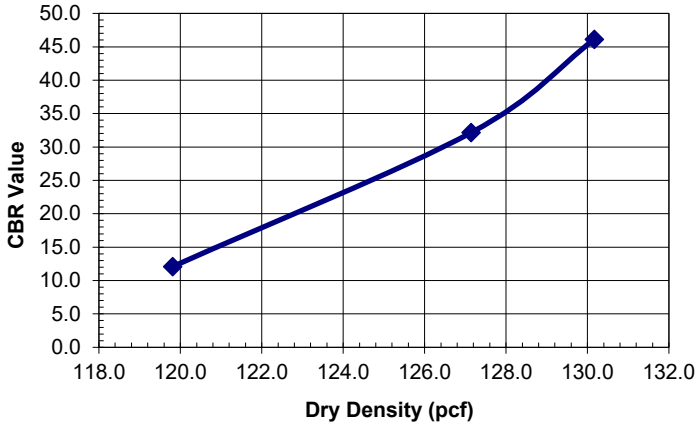
S.W.COLE ENGINEERING, INC.

Report of California Bearing Ratio

ASTM D1883-07

Project Name:	BIA Taxiway A Reconstruction	**Project Number:**	25-0600
Project Location:	Bangor, ME	**Lab ID:**	33375B
Client:	Mead and Hunt, Inc.	**Date Received:**	08/27/25
Material Description:	Auger Flight Sample	**Date Completed:**	09/30/25
Material Source:	B-4A, 4-6 feet +/-	**Tested By:**	AC

CBR Value at 95% Compaction: 32.0



Moisture Content as Compacted:	7.9%
Dry Density at 95% Compaction:	126.6 pcf
ASTM Test Method Used:	D698
Surcharge Weight:	15 lbs
Condition of Sample:	Unsoaked
Moisture Content of Top 1 inch:	7.9%
Swell (% of initial height):	Test Not Performed
Material Retained on ¾" sieve:	5%

Comments:

Reviewed By: Tom Higgins

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S.W.COLE ENGINEERING, INC.

Report of Drilled Concrete Core Compressive Strength

ASTM C42

Project Name:	BIA Taxiway A Reconstruction	**Project Number:**	25-0600
Project Location:	Bangor, ME	**Lab ID:**	Multiple
Client:	Mead and Hunt	**Date Received:**	09/25/25
Material Description:	Concrete Cores	**Date Completed:**	10/01/25
Material Source:	Taxiway	**Tested By:**	TH

Sample Info:

Core ID	C-2, 33458B	C-8, 33459B
Date Drilled:	8/25/2025	8/25/2025
Date prepared for testing (wet cut of core ends)	9/25/2025	9/25/2025
Date Tested:	10/1/2025	10/1/2025
Date Concrete was Placed	N/A	N/A
Nominal Max. Agg Size	1 1/2"	1 1/2"

Dimensions:

Diameter (in)	5.98	5.97
Ave. Received Length (in)	13.50	17.00
Ave. Trimmed Length (in)	8.6	8.2
Ave. Capped Length (in)	8.67	8.28
Weight (lbs)	19.27	18.8
Density (lbs/ft3)	138	142

Reinforcement:

Type	None	None
Location		

Break Results:

Age of Concrete (days)	N/A	N/A
Direction of Load Application	Parallel	Parallel
Max Load (kips)	110.59	141.83
Break Type (see Figure 1)	3	4
Strength (psi)	**3940**	**5070**
Corrected Strength (psi)	**3759**	**4798**

Figure 1:



Type 1
Reasonably well-formed cones on both ends, less than 1 in. [25 mm] of cracking through caps

Type 2
Well-formed cone on one end, vertical cracks running through caps, no well-defined cone on other end

Type 3
Columnar vertical cracking through both ends, no well-formed cones

Type 4
Diagonal fracture with no cracking through ends; tap with hammer to distinguish from Type 1

Type 5
Side fractures at top or bottom (occur commonly with unbonded caps)

Type 6
Similar to Type 5 but end of cylinder is pointed

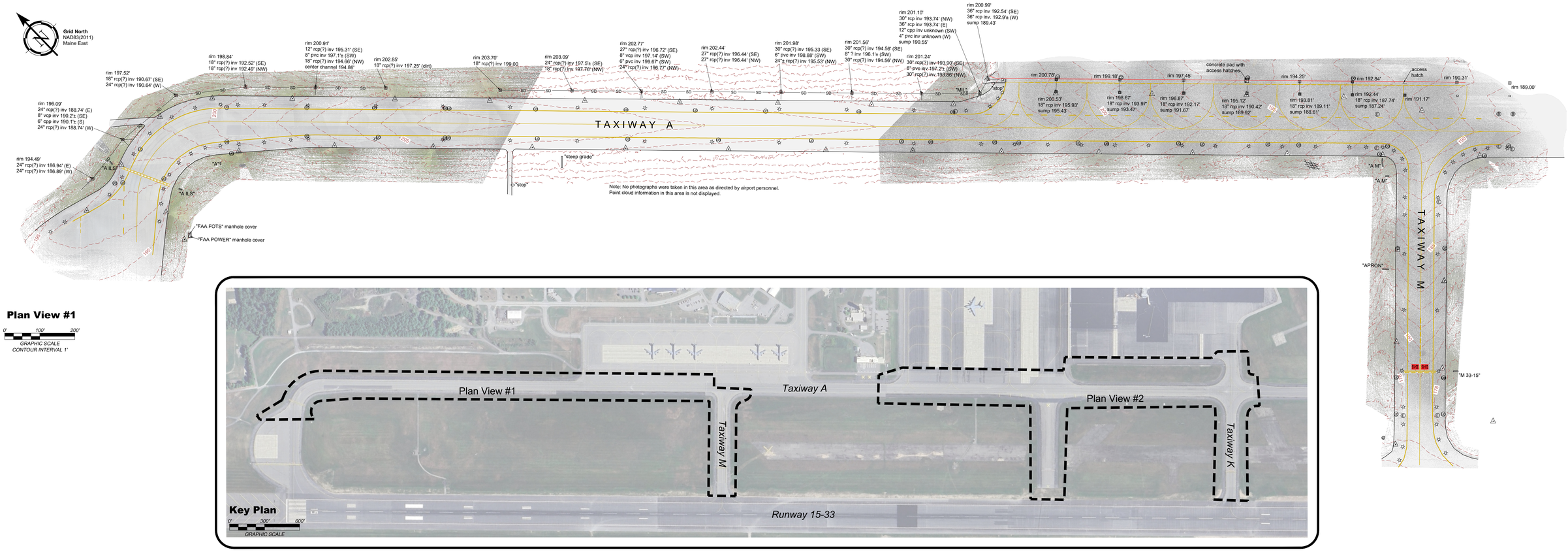
Comments:

Reviewed By: Tom Higgins

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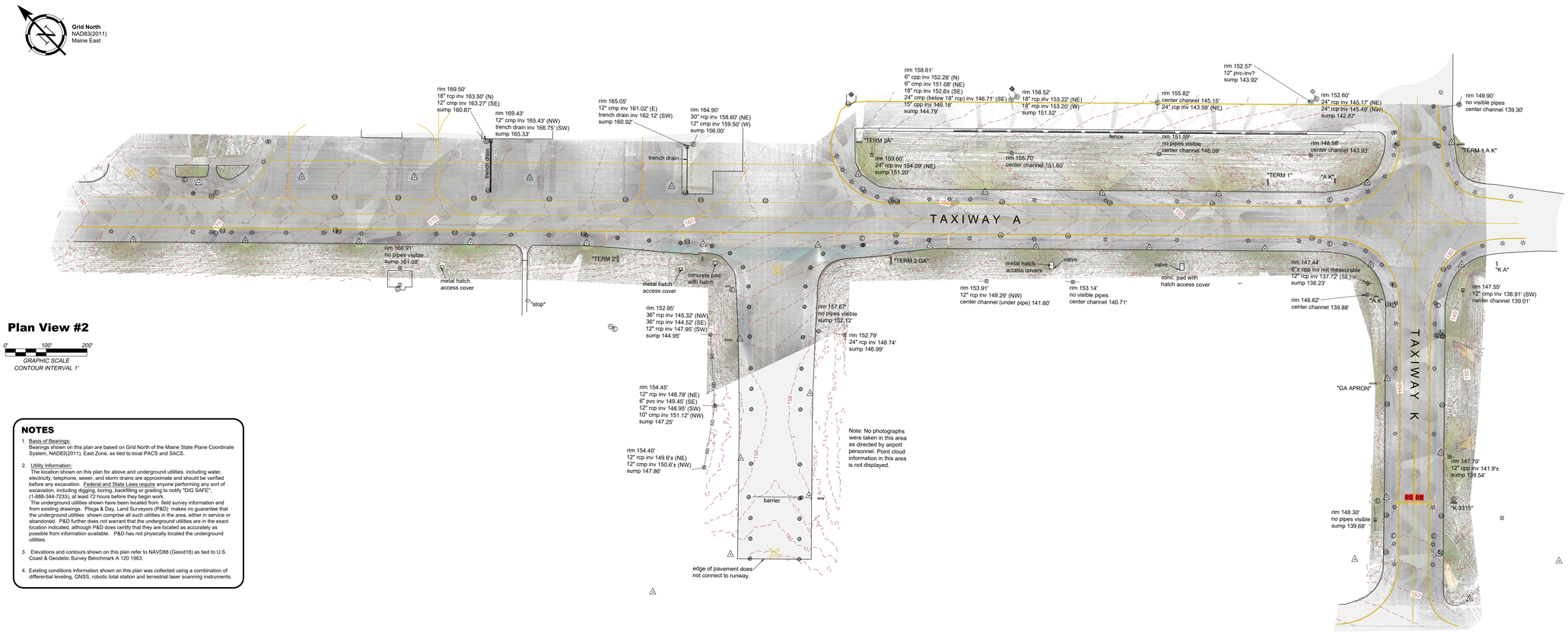
APPENDIX 3

EXISTING CONDITIONS DRAWINGS



Plan View #1

0' 100' 200'
GRAPHIC SCALE
CONTOUR INTERVAL 1'



Plan View #2

0' 100' 200'
GRAPHIC SCALE
CONTOUR INTERVAL 1'

NOTES

1. Basis of Bearings:
   Bearings shown on this plan are based on Grid North of the Maine State Plane Coordinate System, NAD83(2011), East Zone, as tied to local PACS and SACS.

2. Utility Information:
   The location shown on this plan for above and underground utilities, including water, electricity, telephone, sewer, and storm drains are approximate and should be verified before any excavation. Federal and State Laws require anyone performing any sort of excavation, including digging, boring, backfilling or grading to notify "DIG SAFE", (1-888-344-7233), at least 72 hours before they begin work.
   The underground utilities shown have been located from field survey information and from existing drawings. Plisga & Day, Land Surveyors (P&D) makes no guarantee that the underground utilities shown comprise all such utilities in the area, either in service or abandoned. P&D further does not warrant that the underground utilities are in the exact location indicated, although P&D does certify that they are located as accurately as possible from information available. P&D has not physically located the underground utilities.

3. Elevations and contours shown on this plan refer to NAVD88 (Geoid18) as tied to U.S. Coast & Geodetic Survey Benchmark A 120 1963.

4. Existing conditions information shown on this plan was collected using a combination of differential leveling, GNSS, robotic total station and terrestrial laser scanning instruments.

LEGEND

- Rock/Exposed Ledge
- Control Point
- Manhole (S=Sewer, D=Drain, E=Elec.)
- "UD" Underdrain Cover
- Cleanout
- Metal Plate
- Catch Basin
- Sign
- Taxi Light
- Edge of Pavement
- Concrete Pad
- Edge of Gravel
- Sanitary Sewer
- Overhead Utilities
- Underground Elec./Comm. Utilities
- Water Line
- Storm Drain
- Gas Line
- Treeline
- Retaining Wall
- Chain Link Fence
- Contour

CERTIFICATION

STATE OF MAINE
STEVENSON W. SHEPPARD
2086
LICENSED LAND SURVEYOR

PLISGA & DAY Land Surveyors, hereby certifies to Mead & Hunt, exclusively, that to the best of our knowledge and belief this survey conforms to Standards of Practice adopted by the Maine Board of Licensure for Professional Land Surveyors, except no boundary survey was performed.

PLISGA & DAY LAND SURVEYORS

Date: December 12, 2025
Stevenson W. Sheppard
Maine Professional Land Surveyor No. 2086

Topographic Survey

of a portion of

Taxiway A

Bangor International Airport (BGR)

Bangor, Maine

Prepared for

Mead & Hunt

PLISGA & DAY
LAND SURVEYORS
72 MAIN STREET
BANGOR, ME 04401
(207) 947-0019
w w w . w e m a p i t . c o m

PROJECT NUMBER: 25236	SHEET: 1 OF 1
DATE: December 12, 2025	
SCALE: as shown	

APPENDIX 4

BGR DBE PROGRAM

Appendix B

DISADVANTAGED BUSINESS ENTERPRISE (DBE) PLAN for FEDERAL AVIATION ADMINISTRATION (FAA) AIRPORT IMPROVEMENT PROGRAM (AIP) PROJECTS at BANGOR INTERNATIONAL AIRPORT BANGOR, MAINE

REVISED OCTOBER 2024

DISADVANTAGED BUSINESS ENTERPRISE (DBE) PLAN
FOR FEDERAL AVIATION ADMINISTRATION (FAA) AIRPORT IMPROVEMENT PROGRAM (AIP) PROJECTS

October 2024

TABLE OF CONTENTS

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Subpart B – Administrative Requirements…….…….	5
Subpart C – Goals, Good Faith Efforts, and Counting……..……..	10
Subpart D – Certification Standards…….	18
Subpart E – Certification Procedures…..……..	18
Subpart F – Compliance and Enforcement……..	18

Attachments:

1 - Regulations: 49 CFR Part 26

2 – Organizational Chart

3 – DBE Questionnaire

4 – Overall Goal Calculation

5 – Breakout of Estimated Race-Neutral & Race Conscious Participation

6 – UCP Agreement between City of Bangor and State of Maine

7 – Fostering Small Business Participation Form

8 – Bidder's List Collection Form

9 - DBE Certification Application Form and Directory

10 - Demonstration of Good Faith Efforts

11 - DBE Monitoring and Enforcement Mechanisms

12 – Small Business Element Plan

13 - Revision Log

Section 26.1, 26.23 Objectives/Policy Statement

The **Bangor International Airport** has established a Disadvantaged Business Enterprise (DBE) program in accordance with regulations of the U.S. Department of Transportation (DOT), 49 CFR Part 26. The **Bangor International Airport** has received Federal financial assistance from the Department of Transportation, the **Bangor International Airport** has signed an assurance that it will comply with 49 CFR Part 26 (hereafter referred to as "Part 26").

It is the policy of the **Bangor International Airport** to ensure that DBEs, as defined in Part 26, have an equal opportunity to receive and participate in DOT-assisted contracts. It is also the **Bangor International Airport** policy to engage in the following actions on a continuing basis:

1. Ensure nondiscrimination in the award and administration of DOT-assisted contracts;
2. Create a level playing field on which DBEs can compete fairly for DOT-assisted contracts;
3. Ensure that the DBE Program is narrowly tailored in accordance with applicable law;
4. Ensure that only firms that fully meet 49 CFR Part 26 eligibility standards are permitted to participate as DBEs;
5. Help remove barriers to the participation of DBEs in DOT-assisted contracts;
6. Promote the use of DBEs in all types of federally-assisted contracts and procurement activities;
7. Assist the development of firms that can compete successfully in the marker place outside the DBE Program; and
8. Make appropriate use of the flexibility afforded to recipients of Federal financial assistance in establishing and providing opportunities for DBEs.

The **Manager of Airfield Operations, Beth Martin,** has been designated as the DBE Liaison Officer. In that capacity, **Ms. Martin** is responsible for implementing all aspects of the DBE program. Implementation of the DBE program is accorded the same priority as compliance with all other legal obligations incurred by the **Bangor International Airport** in its financial assistance agreements with the Department of Transportation.

The **Bangor International Airport** has disseminated this policy statement to the **City of Bangor, Maine** and all the components of its organization. We have distributed this statement to DBE and non-DBE business communities that perform work for them on DOT-assisted contracts **through a legal notice announcement and by publishing notice of DBE participation in all legal notices for advertising of contracts for federally funded projects.**

Jose Saavedra, C.M.
Airport Director

11/14/2024
Date

SUBPART A - GENERAL REQUIREMENTS

Section 26.1 Objectives

The objectives are found in the policy statement on the first page of this program.

Section 26.3 Applicability

The **Bangor International Airport** is the recipient of Federal airport funds authorized by 49 U.S.C. 47101, et seq.

Section 26.5 Definitions

The **Bangor International Airport** will use terms in this program that have their meanings defined in Part 26, §26.5.

Section 26.7 Non-discrimination Requirements

The **Bangor International Airport** will never exclude any person from participation in, deny any person the benefits of, or otherwise discriminate against anyone in connection with the award and performance of any contract covered by 49 CFR Part 26 on the basis of race, color, sex, or national origin.

In administering its DBE program, the **Bangor International Airport** will not, directly or through contractual or other arrangements, use criteria or methods of administration that have the effect of defeating or substantially impairing accomplishment of the objectives of the DBE program with respect to individuals of a particular race, color, sex, or national origin.

Section 26.11 Record Keeping Requirements

Reporting to DOT

The **Bangor International Airport** will provide data about its DBE Program to the Department as directed by FAA operating administrations.

DBE participation will be reported to the DOT as follows:

> DBE participation will be reported to **FAA** annually, by or before December 1, the information required for the "Uniform Report of DBE Awards or Commitments and Payments", as described in Appendix B to Part 26. The **Bangor International Airport** will similarly report the required information about participating DBE firms. All reporting will be done through the **FAA** official reporting system, or another form acceptable to **FAA** as instructed thereby.

Bidders List

The **Bangor International Airport** will collect bidders list information as described in Section 26.11(c)(2) and enter it into the system designed by DOT. The purpose of the list is to compile as accurate data as possible about the universe of DBE and non-DBE contractors and subcontractors who seek to work on the federally assisted contracts for use in helping to set overall goals, and to provide the Department with data for evaluating the extent to which the objectives of Section 26.1 are being achieved.

The **Bangor International Airport** will obtain the following bidders list information about all DBE and non-DBEs who bid as prime contractors and subcontractors on all federally assisted contracts:

- Firm name

- Firm Address including Zip code
- Firm's status as a DBE or non-DBE
- Race and gender information for the firm's majority owner
- NAICS code applicable to each scope of work the firm sought to perform in its bid
- Age of the firm
- Annual gross receipts of firms. Annual gross receipts data will be collected by asking the firm to indicate into what gross receipts bracket they fit (e.g., less than $1 million; $1-3 million; $3-6 million; $6-10 million; etc.) rather than requesting an exact figure from the firm.

The **Bangor International Airport** will collect the data from all bidders for all federally assisted contracts by requiring the information listed above to be submitted with bids or initial responses to negotiated procurements.

The **Bangor International Airport** will enter this data in the FAA's designated system no later than December 1 following the fiscal year in which the relevant contract was awarded.

In the case of a "design-build" contracting situation where subcontracts will be solicited throughout the contract period as defined in a DBE Performance Plan pursuant to Section 26.53. The **Bangor International Airport** will enter the data no later than December 1 following the fiscal year in which the design-build contractor awards the relevant subcontract(s).

Section 26.13 Federal Financial Assistance Agreement

The **Bangor International Airport** has signed the following assurances, applicable to all DOT-assisted contracts and their administration:

Assurance: Each financial assistance agreement the **Bangor International Airport** signs with a DOT operating administration (or a primary recipient) will include the following assurance:

> The **Bangor International Airport** shall not discriminate on the basis of race, color, national origin, or sex in the award and performance of any DOT-assisted contract or in the administration of its DBE program or the requirements of 49 CFR Part 26. The **Bangor International Airport** shall take all necessary and reasonable steps under 49 CFR Part 26 to ensure nondiscrimination in the award and administration of DOT-assisted contracts. The **Bangor International Airport** DBE program, as required by 49 CFR Part 26 and as approved by DOT, is incorporated by reference in this agreement. Implementation of this program is a legal obligation and failure to carry out its terms shall be treated as a violation of this agreement. Upon notification to the **Bangor International Airport** of its failure to carry out its approved program, the Department may impose sanctions as provided for under 49 CFR Part 26 and may, in appropriate cases, refer the matter for enforcement under 18 U.S.C. 1001 and/or the Program Fraud Civil Remedies Act of 1986 (31 U.S.C. 3801 et seq.).

Contract Assurance: The **Bangor International Airport** will ensure the following clause is included in each DOT-funded contract it signs with a contractor (and each subcontract the prime contractor signs with a subcontractor):

> The contractor, sub recipient or subcontractor shall not discriminate on the basis of race, color, national origin, or sex in the performance of this contract. The contractor shall carry out applicable requirements of 49 CFR Part 26 in the award and administration of DOT-assisted contracts. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract or such other remedy as the **Bangor International Airport** deems appropriate, which may include, but is not limited to:
>
> 1. Withholding monthly progress payments;

2. Assessing sanctions;
3. Liquidated damages; and/or
4. Disqualifying the contractor from future bidding as non-responsible.

SUBPART B - ADMINISTRATIVE REQUIREMENTS

Section 26.21 DBE Program Updates

The **Bangor International Airport** is required to have a DBE program meeting the requirements of this part as it will receive grants for airport planning or development and will award prime contracts, cumulative total value of which exceeds $250,000 in FAA funds in a federal fiscal year. The **Bangor International Airport** is not eligible to receive DOT financial assistance unless DOT has approved this DBE program and the **Bangor International Airport** is in compliance with it and Part 26. The **Bangor International Airport** will continue to carry out this program until all funds from DOT financial assistance have been expended. The **Bangor International Airport** does not have to submit regular updates of the DBE program document, as long as it remains in compliance. However, significant changes in the program, including those required by regulatory updates, will be submitted for DOT approval.

Section 26.23 Policy Statement

The Policy Statement is elaborated on the first page of this program.

Section 26.25 DBE Liaison Officer (DBELO)

The **Bangor International Airport** has designated the following individual as the DBE Liaison Officer:

Name:	**Beth Martin**
Title:	**Manager of Airfield Operations**
Address:	**287 Godfrey Boulevard**
	Bangor, Maine 04401
Telephone:	**207-992-4602**
Email:	**bmartin@flybangor.com**

In that capacity, the DBELO is responsible for implementing all aspects of the DBE program and ensuring that **Bangor International Airport** complies with all provisions of 49 CFR Part 26. The DBELO has direct, independent access to the **Airport Director** concerning DBE program matters. An organization chart displaying the DBELO's position in the organization is found in **Attachment 2**.

The responsibility for overseeing the DBE Plan is fulfilled by the DBELO on a part-time basis. To assist in monitoring the Plan, the DBELO has a part time general staff assistant.

The DBELO is responsible for developing, implementing and monitoring the DBE program, in coordination with other appropriate officials and representatives of the Airport. Duties and responsibilities of the DBELO include the following:

1. Gathers and reports statistical data and other information as required by DOT.
2. Reviews third party contracts and purchase requisitions for compliance with this program.
3. Works with all departments to set overall annual goals.
4. Ensures that bid notices and requests for proposals are available to DBEs in a timely manner.
5. Identifies contracts and procurements so that DBE goals are included in solicitations (both race-neutral methods and contract specific goals) and monitors results.
6. Analyzes progress toward attainment and identifies ways to improve progress.
7. Participates in pre-bid meetings.

8. Advises the **Airport Director and Airport Staff** on DBE matters and achievement.
9. Determine contractor compliance with good faith efforts.
10. Provides DBEs with information and assistance in preparing bids, obtaining bonding and insurance.
11. Acts as liaison to the Uniform Certification Program (UCP) in the State of Maine.

Section 26.27 DBE Financial Institutions

It is the policy of the **Bangor International Airport** to investigate the full extent of services offered by financial institutions owned and controlled by socially and economically disadvantaged individuals in the community, to make reasonable efforts to use the institutions, and to encourage prime contractors on DOT-assisted contracts to make use of these institutions. These investigations will be completed by reviewing the DOT DBE directories as well as researching possible financial institutions online for the potential to be utilized on a project. These investigations will be completed each time a DOT-assisted contract is being developed. The **Bangor International Airport** will encourage prime contractors on DOT-assisted contracts to make use of these institutions.

Section 26.29 Prompt Payment Mechanisms

The **Bangor International Airport** requires that all subcontractors performing work on DOT-assisted contracts shall be promptly paid for work performed pursuant to their agreements, in accordance with all relevant federal, state, and local law. Prompt payment and return of retainage requirements also apply to lower-tier subcontractors.

In accordance with 49 CFR §26.29, the **Bangor International Airport** established a contract clause implementing this requirement and requires prime contractors to pay subcontractors for satisfactory performance of their contracts no later than 30 days from the prime contractor's receipt of each payment from the **Bangor International Airport**.

The **Bangor International Airport** ensures prompt and full payment of retainage from the prime contractor to the subcontractor within **30** days after the subcontractor's work is satisfactorily completed. Pursuant to §26.29, the **Bangor International Airport** will include the following clause in each DOT-assisted prime contract to comply with this requirement:

The Bangor International Airport will hold retainage from prime contractors and provide for prompt and regular incremental acceptances of portions of the prime contract, pay retainage to prime contractors based on these acceptances, and require a contract clause obligating the prime contractor to pay all retainage owed to the subcontractor for satisfactory completion of the accepted work within 30 days after payment to the prime contractor.

For every airport construction project funded under Federal grant assistance programs, the **Bangor International Airport** includes the applicable clause from FAA Advisory Circular 150/4370-10 (Section 90-06) pertaining to the selected retainage method. The applicable clause will be included verbatim. However, if state or local prompt payment laws provide for payment in less than 30 days, any reference to "30 days" will be revised accordingly.

To implement this measure, **The Bangor International Airport** includes the following clause from FAA Advisory Circular 150/5370-10 in each DOT-assisted prime construction contract:

> "From the total of the amount determined to be payable on a partial payment**, ten (10)** percent of such total amount will be deducted and retained by the **Bangor International Airport** for protection of the **Bangor International Airport's** interests. Unless otherwise instructed by the **Bangor International Airport**, the amount retained will be in effect until the final payment is made except as follows:

1. Contractor may request release of retainage on work that has been partially accepted by the **Bangor International Airport** in accordance with Section 50-14. Contractor must provide a certified invoice to the RPR that supports the value of retainage held by the **Bangor International Airport** for partially accepted work.
2. In lieu of retainage, the Contractor may exercise at its option the establishment of an escrow account per paragraph 90-08.

The Contractor is required to pay all subcontractors for satisfactory performance of their contracts no later than 30 days after the Contractor has received a partial payment. Contractor must provide the **Bangor International Airport** evidence of prompt and full payment of retainage held by the prime Contractor to the subcontractor within 30 days after the subcontractor's work is satisfactorily completed. A subcontractor's work is satisfactorily completed when all the tasks called for in the subcontract has been accomplished and documented as required by the **Bangor International Airport**. When the **Bangor International Airport** has made an incremental acceptance of a portion of a prime contract, the work of a subcontractor covered by that acceptance is deemed to be satisfactorily completed.

When at least 95% of the work has been completed to the satisfaction of the Resident Project Representative (RPR), the RPR shall, at the **Bangor International Airport's** discretion and with the consent of the surety, prepare estimates of both the contract value and the cost of the remaining work to be done. The **Bangor International Airport** may retain an amount not less than twice the contract value or estimated cost, whichever is greater, of the work remaining to be done. The remainder, less all previous payments and deductions, will then be certified for payment to the Contractor."

Prompt Payment Monitoring for DBEs and Non-DBEs

The **Bangor International Airport** clearly understands and acknowledges that reliance on complaints or notifications from subcontractors about a contractor's failure to comply with prompt payment and retainage requirements is not a sufficient monitoring and oversight mechanism. Therefore, the **Bangor International Airport** undertakes proactive monitoring and oversight of prime contractors' compliance with subcontractor prompt payment and return of retainage requirements of 49 CFR Part 26. Such monitoring activities will be accomplished through the following method(s):

a. Random on-site visits by the Airport (**Bangor International Airport**) representatives;
b. Prime contractor's sworn statements included in monthly invoicing; and
c. The Airport may perform interim audits of the contractor's payments to DBEs to ensure the actual amount paid to DBE subcontractors equals the amount reported.

The **Bangor International Airport** requires prime contractors to maintain records and documents of payments to subcontractors, including DBEs, for a minimum of three (3) years unless provided by applicable record retention requirements for the **Bangor International Airport's** financial assistance agreement, whichever is longer. These records will be made available for inspection upon request by any authorized representative of the **Bangor International Airport** or DOT. This reporting requirement extends to all subcontractors, both DBE and non-DBE.

The **Bangor International Airport** proactively reviews contract payments to subcontractors including DBEs quarterly. Payment reviews will evaluate whether the actual amount paid to DBE subcontractors is equivalent to the amount reported to the **Bangor International Airport** by the prime contractor.

Prompt Payment Dispute Resolution

The **Bangor International Airport** will take the following steps to resolves disputes as to whether work has been satisfactorily completed for purposes of Section 26.29:

a. All information regarding the dispute will be gathered individually from disputing parties;

b. Meetings will be held between the **Bangor International Airport**, Prime, Sub, and RPR to discuss the disputes. Any meeting with the purpose of dispute resolution will include individuals authorized to bind each interest party, including the **Bangor International Airport's** representative(s) with authority to take enforcement action;
c. Follow up written confirmation of the resolution will follow the meeting.

The **Bangor International Airport** has established, as part of its DBE program, the following contract clause to ensure prompt payment and return of retainage:

> "The Contractor will not be reimbursed for work performed by the Subcontractor unless and until the Contractor ensures that the Subcontractor is promptly paid for the work they have performed."

Prompt Payment Complaints
Complaints by subcontractors regarding the prompt payment requirements are handled according to the following procedure:

1. The affected subcontractor should contact the DBELO to initiate a complaint if the affected subcontractor is not comfortable contacting the prime contractor directly regarding payment or is unable to resolve payment discrepancies with the prime contractor.
2. If a prompt payment complaint filed with the DBELO does not result in a timely and meaningful action by the **Bangor International Airport** to resolve prompt payment disputes, the affected subcontractor may contact the responsible operating administration contact listed in Section 26.53 of this DBE program.
3. For compliance with Section 157 of the FAA Reauthorization Act of 2018, all complaints related to prompt payment will be reported in a format acceptable to the FAA, including the nature and origin of the complaint and its resolution.

Enforcement Actions for Noncompliance of Participants
The **Bangor International Airport** will provide appropriate means to enforce the requirements of Section 26.29. These means include:

1. Advising subcontractors of the availability of the payment and performance bond to assure payment for labor and materials in the execution of the work provided for in the contract.
2. Issue a stop-work order until payments are released to subcontractors, specifying in the contract that such orders constitute unauthorized delays for the purposes of calculating liquidated damages if milestones are not met.
3. Issue a notice of noncompliance to relevant parties, followed by contract termination.

The **Bangor International Airport** will actively implement the enforcement actions detailed above.

Section 26.31 Directory

The **Bangor International Airport** is a non-certifying member of the Maine Unified Certification Program (UCP). The UCP maintains a directory identifying all firms eligible to participate as DBEs, which contains all elements required by §26.31.

The directory lists the firm's name, address, phone number, website, date of most recent certification, and the type of work the firm has been certified to perform as a DBE and/or ACDBE. The Directory is an online system that permits the public to search and/or filter for DBEs by: 1. Physical Location, 2. NAICS code(s), 3. Work descriptions, 4. All additional data fields of readily verifiable optional information described above. The UCP directory may include additional data fields of other items readily verifiable in State or locally maintained databases, such as State licenses held, Pre-qualifications, and Bonding capacity.

The Directory is revised every Friday at 4 pm. The Directory shall be available from the MaineDOT at the following address:

Maine Department of Transportation
Civil Rights Office
#16 State House Station
Augusta, ME 04333-0016
Tel. 207-624-3042 (Director) or at the following web site:
http://www.maine.gov/mdot/civilrights/dbe
https://www.maine.gov/mdot/civilrights/docs/dbe/2022/WeeklyDBEVendorList.pdf

The directory includes a prominently displayed disclaimer that states the information within the directory is not a guarantee of the DBE's capacity and ability to perform work.

Section 26.33 Over-concentration

The **Bangor International Airport** has not identified that over-concentration existing in the types of work that DBEs perform.

Section 26.35 Business Development Programs

The **Bangor International Airport** has not established a business development or mentor-protégé program as described by 49 CFR Part 26.

Section 26.37 Monitoring

The **Bangor International Airport** implements and carries out appropriate mechanisms to ensure compliance with 49 CFR Part 26 program requirements by all program participants, and describes and set forth these mechanisms in the **Bangor International Airport's** DBE program.

The **Bangor International Airport** actively monitors participation towards overall goals by maintaining running tally that provides for a frequent comparison of cumulative DBE awards/commitments to DOT-assisted prime contract awards to determine whether our implementation of contract goals is projected to be sufficient to meet the annual goal. The running tally for overall goal monitoring will be maintained through record of the monthly payments to contractors and subcontractors on DOT-assisted contracts. This mechanism to maintain a running tally of overall goal attainment will be used to inform the **Bangor International Airport's** decisions to implement goals on contracts to be advertised, according to our established contract goal-setting process.

The **Bangor International Airport** actively monitors participation with respect to each DBE commitment by using a running tally that provides for a frequent comparison of payments made to each listed DBE relative to the progress of work, including payments for such work to the prime contractor. The running tally for contract goal monitoring will be maintained by record of monthly payments to listed DBEs on DOT-assisted contracts. These contract-specific running tallies will be used to determine whether the contractor is on track with meeting its DBE commitment and whether any projected shortfall exists that requires the prime contractor's good faith efforts to address to meet the contract goal pursuant to Section 26.53.

Monitoring Contracts and Work Sites
The **Bangor International Airport** reviews contracting records and engages in active monitoring of work sites to ensure that work committed to DBEs at contract award or subsequently (*e.g.*, as the result of modification to the contract) is actually performed by the DBEs to which the work was committed,

and such work is counted according to the requirements of Section 26.55. Work site monitoring for counting and commercially useful function review is performed by a hired consulting firm, resident engineer, or DBELO. Contracting records are reviewed by a hired consulting firm or the DBELO. The **Bangor International Airport** will maintain written certification that contracting records have been reviewed and work sites have been monitored to ensure the counting of each DBE's participation is consistent with its function on the contract.

Section 26.39 Fostering Small Business Participation

The **Bangor International Airport** has created a Small Business element to structure contracting requirements to facilitate competition by small business concerns, taking all reasonable steps to eliminate obstacles to their participation, including unnecessary and unjustified bundling of contract requirements that may preclude small business participation in procurements as prime contractors or subcontractors.

The **Bangor International Airport's** small business program element is incorporated as **Attachment 12** to this DBE Program. The program elements will be actively implemented to foster small business participation. Implementation of the small business element is required in order for the **Bangor International Airport** to be considered by DOT as implementing this DBE program in good faith.

SUBPART C - GOALS, GOOD FAITH EFFORTS, AND COUNTING

Section 26.43 Set-asides or Quotas

The **Bangor International Airport** does not use quotas or race-conscious set-asides in any way in the administration of this DBE program.

Section 26.45 Overall Goals

The **Bangor International Airport** will establish an overall DBE goal covering a three-year federal fiscal year period if it anticipates awarding DOT-funded prime contracts the cumulative total value of which exceeds $250,000 in DOT funds during any one or more of the reporting fiscal years within the three-year goal period. In accordance with §26.45(f), the **Bangor International Airport** will submit its Overall Three-year DBE goal to the **FAA** by August 1st of the year in which the goal is due, as required by the schedule established and posted to the website of the **FAA.**

https://www.faa.gov/about/dbe-and-acdbe-program-reporting-requirements-recipients

The DBE goals will be established in accordance with the 2-step process as specified in 49 CFR Part 26.45. If the **Bangor International Airport** does not anticipate awarding prime contracts the cumulative total value of which exceeds $250,000 in DOT funds during any of the years within the three-year reporting period, an overall goal will not be developed. However, this DBE Program will remain in effect and the **Bangor International Airport** will seek to fulfill the objectives outlined in 49 CFR Part 26.1

Step 1. The first step is to determine a base figure for the relative availability of DBEs in the market area. The **Bangor International Airport** will use the MEDOT Disadvantaged Business Enterprise Directory and Census Bureau Data as a method to determine the base figure. The **Bangor International Airport** understands that the exclusive use of a list of prequalified contractors or plan holders, or a bidders list that does not comply with the requirements of 49 CFR Part 26.45(c)(2), is not an acceptable alternative means of determining the availability of DBEs.

Step 2. The second step is to adjust, if necessary, the "base figure" percentage from Step 1 so that it reflects as accurately as possible the DBE participation the **Bangor International Airport** would expect in the absence of discrimination. Adjustments may be made based on past participation, information from a disparity study (to the extent it is not already accounted for in the base goal), and/or information about barriers to entry to past competitiveness of DBEs on contracts. The **Bangor International Airport** will examine all the evidence available in its jurisdiction to determine what adjustment, if any, is needed. If the evidence does not suggest an adjustment is necessary, then no adjustment shall be made. Any methodology selected will be based on demonstratable evidence of local market conditions and be designed to ultimately attain a goal that is rationally related to relative availability of DBEs in the **Bangor International Airport** market. In addition to the aforementioned methods for adjustment, the State of Maine Department of Transportation (MaineDOT) has issued a DBE goal for Federally Assisted Aviation Projects for federal fiscal years 2024-2026. This goal will be incorporated into the base figure adjustment.

In establishing the overall goal, the **Bangor International Airport** will provide for consultation and publication. This includes consultation with minority, women's and general contractor groups, community organizations, and other officials or organizations which could be expected to have information concerning the availability of disadvantaged and non-advantaged businesses, the effects of discrimination on opportunities for DBEs, and the effort by the **Bangor International Airport** to establish a level playing field for the participation of DBEs. The consultation will include a scheduled, direct, interactive exchange (video conference, teleconference) with as many interested stakeholders as possible focused on obtaining information relevant to the goal setting process, and it will occur before the **Bangor International Airport** is required to submit the goal methodology to the **FAA** for review pursuant to §26.45(f). The goal submission will document the consultation process in which the **Bangor International Airport** engaged. Notwithstanding paragraph (f)(4) of §26.45, the proposed goal will not be implemented until this requirement is met.

In addition to the consultation described above, the **Bangor International Airport** will publish a notice announcing the proposed overall goal before submission to the **FAA** on August 1st. The notice will be posted on the **Bangor International Airport's** official internet web site and may be posted to other sources (e.g., minority-focused media, trade association publications). If the proposed goal changes following review by **FAA**, the revised goal will be posted on the official web site.

The public will also be informed that the proposed overall goal and its rational area available for inspection during normal business hours at the principal office of the **Bangor International Airport**. This notice will provide that the **Bangor International Airport** and **FAA** will accept comments on the goals for 30 days from the date of the notice. Notice of the comment period will include addresses to which comments may be sent (including offices and websites) where the proposal may be reviewed. The public comment period will not extend the August 1st deadline.

The Overall Three-Year DBE Goal submission to **FAA** will include any information and comments received, who provided the comment, and how the **Bangor International Airport** considered and responded to any comments and information received before finalizing the goal.

The **Bangor International Airport** will begin using the overall goal on October 1st of the relevant period, unless other instruction from **FAA** have been received.

Project Goals

If permitted or required by the **FAA** Administrator, an overall goal may be expressed as a percentage of funds for a particular grant or project or group of grants and/or projects, including entire projects. Like other overall goals, a project goal may be adjusted to reflect changed circumstances, with the concurrence of the appropriate operating administration. A project goal is an overall goal and must meet

all the substantive and procedural requirements of this section pertaining to overall goals. A project goal covers the entire length of the project to which it applies. The project goal will include a projection of the DBE participation anticipated to be obtained during each fiscal year covered by the project goal. The funds for the project to which the project goal pertains are separated from the base from which the regular goal, applicable to contracts not part of the project covered by a project goal, is calculated.

If the goal establishes on a project basis, the goal will be used by the time of the first solicitation for a DOT-assisted contract for the project.

Prior Operating Administration Concurrence

The **Bangor International Airport** understands that prior **FAA** concurrence with the overall goal is not required. However, if the **FAA** reviews suggest that the overall goal has not been correctly calculated or that the method employed by the **Bangor International Airport** for calculating goals is inadequate, **FAA** may, after consulting with the **Bangor International Airport**, adjust the overall goal or require that the goal be adjusted by the **Bangor International Airport.** The adjusted overall goal is binding. In evaluating the adequacy or soundness of the methodology used to derive the overall goal, the U.S. DOT operating administration will be guided by the goal setting principles and best practices identified by the Department in guidance issued pursuant to §26.9.

A description of the methodology to calculate the overall goal and the goal calculations can be found in **Attachment 4** to this program.

Section 26.47 Failure to meet overall goals

The **Bangor International Airport** cannot be penalized, or treated by the Department as being in noncompliance with Part 26, because DBE participation falls short of an overall goal, unless the **Bangor International Airport** fails to administer its DBE program in good faith.

The **Bangor International Airport** understands that to be considered to be in compliance with this part, an approved DBE Program and overall DBE goal, if applicable, must be maintained, and this DBE Program must be administered in good faith.

The **Bangor International Airport** understands that if the awards and commitments shown on the Uniform Report of Awards and Commitments and Payments at the end of any fiscal year are less than the overall goal applicable to that fiscal year, the following actions must be taken in order to be regarded by the Department as implementing this DBE Program in good faith:

1. Analyze in detail the reasons for the difference between the overall goal and the awards and commitments in that fiscal year;
2. Establish specific steps and milestones to correct the problems identified in the analysis to enable the goal for the new fiscal year to be fully met;
3. The **Bangor International Airport** will prepare, within 90 days of the end of the fiscal year, the analysis and corrective actions developed under paragraphs (1) and (2) of this section. The Airport will retain copy of analysis and corrective actions in records for a minimum of three years, and it will be made available to appropriate funding authorities upon request.

Section 26.51 Mean Recipients Use to Meet Overall Goals

Breakout of Estimated Race-Neutral & Race-Conscious Participation

The **Bangor International Airport** will meet the maximum feasible portion of its overall goal by using race-neutral DBE participation. Race-neutral DBE participation includes any time a DBE wins a prime

contract through customary competitive procurement procedures or is awarded a subcontract on a prime contract that does not carry a DBE contract goal.

Race-neutral means include, but are not limited to the following:

1. Arranging solicitations, times for the presentations of bids, quantities, specifications, and delivery schedules in ways that facilitate participation by DBEs and other small businesses and by making contracts more accessible to small businesses, by means such as those provided under §26.39.
2. Providing assistance in overcoming limitations such as inability to obtain bond requirements, eliminating the impact of surety costs from bids, and providing services to help DBEs, and other small businesses, obtain bonding and financing);
3. Providing technical assistance and other services;
4. Carrying out information and communications programs on contracting procedures and specific contract opportunities (e.g., ensuring the inclusion of DBEs, and other small businesses, on recipient mailing list for bidders; ensuring the dissemination to bidders on primage contract of lists of potential subcontractors; provision of information in languages other than English, where appropriate);
5. Implementing a supportive services program to develop and improve immediate and long-term business management, record keeping, and financial and accounting capability for DBEs and other small businesses; (6) Providing services to help DBEs, and other small businesses, improve long-term development, increase opportunities to participate in variety of kinds of work, handle increasingly significant project, and achieve eventual self-sufficiency;
6. Establishing a program to assist new, start-up firms, particularly in field in which DBE participation has historically been low;
7. Ensuring distribution of the DBE directory, through print and electronic means, to the widest feasible universe of potential prime contractors; and
8. Assisting DBEs, and other small businesses, to develop their capability to utilize emerging technology and conduct business through electronic media.

The breakout of estimated race-neutral and race-conscious participation can be found in **Attachment 5** to this program.

The **Bangor International Airport** will arrange solicitations, times for presentation of bids, quantities, specifications, and delivery schedules in ways that facilitate participation by DBEs and other small businesses and by making contracts more accessible to small businesses, by means such as those provided under §26.39

Contract Goals

If the approved projection under paragraph (c) of §26.51 estimates that the entire overall goal for a given year can be met through race-neutral means, contract goals will not be set during that year, unless the use of contract goals becomes necessary in order to meet the overall goal.

Contract goals will be established only on those DOT-assisted contracts that have subcontracting possibilities. A contract goal need not be established on every such contract, and the size of contract goals will be adapted to the circumstances of each such contract (e.g., type and location of work, availability of DBEs to perform the particular type of work).

Contract goals will be expressed as a percentage of **the total amount of a DOT-assisted contract.**

Section 26.53 Good Faith Efforts Procedures in Situation where there are Contract Goals

Demonstration of good faith effort (pre-award)

In cases where a contract goal has been established, the contract in question will only be awarded to the bidder/offeror that has made good faith efforts to meet the contract goal. The bidder/offeror can demonstrate that it has made good faith efforts by either meeting the contract goal or documenting that is has made adequate good faith efforts to do so. Examples of good faith efforts can be found in Appendix A to Part 26.

DBELO is responsible for determining whether a bidder/offeror who has not met the contract goal has documented sufficient good faith efforts to be regarding as **Responsive.**

The **Bangor International Airport** will ensure that all information is complete and accurate and adequately documents the bidder/offeror's good faith efforts before committing to the performance of the contract by the bidder/offeror.

In all solicitations for DOT-assisted contracts for which a contract goal has been established, the following information will be required for every bidder/offeror:

1. Award of the contract will be conditioned on meeting the requirements of this section;
2. All bidders or offerors will be required to submit the following information to the **Bangor International Airport**, at the time provided in paragraph (3) of this section:
    a. The names and addresses of DBE firms that will participate in the contract;
    b. A description of the work that each DBE will perform. To count toward meeting a goal, each DBE firm must be certified in a NAICS code applicable to the kind of work the firm would perform on the contract;
    c. The dollar amount of the participation of each DBE firm participating;
    d. Written documentation of the bidder/offer's commitment to use a DBE subcontractor whose participation it submits to meet a contract goal; and
    e. Written confirmation from each listed DBE firm that it is participating in the contract in the kind and amount of work provided in the prime contractor's commitment. Each DBE listed to perform work as a regular dealer or distributor must confirm its participation according to the requirements of §26.53(c)(1);
    f. If the contract goal is not met, evident of good faith (as elaborated in Appendix A of Part 26). The documentation of good faith efforts must include copies of each DBE and non-DBE subcontractor quote submitted to the bidder when a non-DBE subcontractor was selected over a DBE for work on the contract; and
3. The bidder/offeror will be required to present the information stipulated in paragraph (2) of this section:
4. Under sealed bid procedure, as a matter of responsiveness, or with initial proposals, under contract negation procedures;

Provided that, in a negotiated procurement, including a design-build procurement, the bidder/offeror may make a contractually binding commitment to meet the goal at the time of bid submission or the presentation of initial proposals but provide the information required by paragraph (2) of this section before the final selection for the contract is made by the **Bangor International Airport**.

For each DBE listed as a regular dealer or distributor the **Bangor International Airport** will make a preliminary counting determination to assess its eligibility for 60 or 40 percent credit, respectively, of the cost of materials and supplies based on its demonstrated capacity and intent to perform as a regular dealer or distributor, as defined in Sections 26.55(e)(2)(iv)(A), (B), (C), and (3) under the contract at issue. The preliminary determination will be made based on the DBE's written responses to relevant questions and its affirmation that its subsequent performance of a commercially useful function will be consistent with the preliminary counting of such participation. Where the DBE supplier does not affirm that its participation will meet the specific requirements of either a regular dealer or distributor, the **Bangor International Airport** will make appropriate adjustments in counting such participation toward the bidder's good faith efforts to meet the contract goal. The bidder is responsible for verifying that the

information provided by the DBE supplier is consistent with the counting of such participation toward the contract goal.

In a design-build contracting situation, in which the **Bangor International Airport** solicits proposals to design and build a project with minimal project details at time of letting, the **Bangor International Airport** may set a DBE goal that proposers must meet by submitting a DBE Open-Ended DBE Performance Plan (OEPP) with the proposal. The OEPP replaces the requirement to provide the information required in paragraph (b) of Section 26.53(b). To be considered responsive, the OEPP must include a commitment to meet the goal and provide details of the types of subcontracting work or services (with projected dollar amounts) that the proposer will solicit DBEs to perform. The OEPP must include an estimated time frame in which actual DBE subcontracts would be executed. Once the design-build contract is awarded, the **Bangor International Airport** will provide ongoing monitoring and oversight to evaluate whether the design-builder is using good faith efforts to comply with the OEPP and schedule. The **Bangor International Airport** and the design-builder may agree to make written revisions of the OEPP throughout the life of the project, e.g., replacing the type of work items the design-builder will solicit DBEs to perform and/or adjusting the proposed schedule, as long as the design-builder continues to use good faith efforts to meet the goal.

The **Bangor International Airport** will apply the requirements of this section to DBE bidders/offerors for prime contracts. In determining whether a DBE bidder/offeror for a prime contract has met a contract goal, the Airport will count the work the DBE has committed to performing with its own forces as well as the work that it has committed to be performed by DBE subcontractors and DBE suppliers.

Administrative reconsideration

Within **7 calendar** days of being informed by the **Bangor International Airport** that it is not a **responsive** bidder/offeror because it has not documented adequate good faith efforts, a bidder/offeror may request administrative reconsideration. Bidder/offerors should make this request in writing to the following reconsideration official:

David Szewczyk
City Solicitor
City of Bangor
Legal Department
73 Harlow Street
Bangor, ME 04401
david.szewczyk@bangormaine.gov
207.992.4275

The reconsideration official will not have played any role it in the original determination that the bidder/offeror did not document sufficient good faith effort.

As part of this reconsideration, the bidder/offeror will have the opportunity to provide written documentation or argument concerning the issue of whether it met the goal or made adequate good faith to do. The bidder/offeror will have the opportunity to meet in person with the reconsideration official to discuss the issue of whether the goal was met or the bidder/offeror made adequate good faith efforts to do. The bidder/offeror will be sent a written decision on reconsideration, explaining the basis for finding that the bidder did or did not meet the goal or make adequate good faith efforts to do so. The results of the consideration process is not administratively appealable to the Department of Transportation.

Good Faith Efforts procedural requirements (post solicitation)

The **Bangor International Airport** will include in each prime contract the contract clause required by Section 26.13(b) stating that failure by the contractor to carry out the requirements of this part is a material breach of the contract and may result in the termination of the contract or such other remedies

set forth in that section that the Airport deems appropriate if the prime contractor fails to comply with the requirements of this section.

The **Bangor International Airport** will require the awarded contractor to make available upon request a copy of all DBE subcontracts. The contractor shall ensure that all subcontracts or agreements with DBEs to supply labor or material include all required contract provisions and mandate that the subcontractor and all lower tier subcontractors perform in accordance with the provisions of Part 26.

Prime contractors will be prohibited from terminating a DBE subcontractor listed in response to a covered solicitation (or an approved substitute DBE firm) without our prior written consent, unless the Airport causes the termination or reduction. A termination includes any reduction or underrun in work listed for a DBE not caused by a material change to the prime contract by the recipient. This requirement applies to instances that include but are not limited to: when a prime contractor seeks to perform work originally designed for a DBE subcontractor with its own forces or those of an affiliate, a non-DBE firm, or with another DBE firm.

The **Bangor International Airport** will include in each prime contract a provision stating that:

1. The contractor must utilize the specific DBEs listed to perform the work and supply the materials for which each is listed unless the contractor obtains the Airport's written consent as provided in Section 26.53(f); and

2. Unless the Airport's consent is provided under Section 26.53(f), the prime contractor must not be entitled to any payment for work or material unless it is performed or supplied by the listed DBE.

Such written consent will be provided only if the **Bangor International Airport** agrees, for reasons stated in the concurrence document, that the prime contractor has good cause to terminate the listed DBE or any portion of its work.

Good cause does not exist if the prime contractor seeks to terminate a DBE or any portion of its work that is relied upon to obtain the contract so that the prime contractor can self-perform the work for which the DBE contractor was engaged, or so that the prime contractor can substitute another DBE or non-DBE contractor after contract award. For purposes of this paragraph, good cause includes the following circumstances:

1. The listed DBE subcontractor fails or refuses to execute the written contract;
2. The listed DBE subcontractor fails or refuses to perform the work of its subcontract in a way consistent with normal industry standards. Provided however, that good cause does not existing if the failure or refusal of the DBE subcontractor to perform its work on the subcontract results from the bad faith or discriminatory action of the prime contractor;
3. The listed DBE subcontractor fails or refuses to meet the prime contractor's reasonable, non-discriminatory bond requirements.
4. The listed DBE subcontractor becomes bankrupt, insolvent, or exhibits credit unworthiness;
5. The listed DBE subcontractor is ineligible to work on public works projects because of suspension and debarment proceedings pursuant to 2 CFR Parts 180, 215 and 1,200 or applicable state law;
6. The Airport determined that the listed DBE subcontractor is not a responsible contractor;
7. The listed DBE subcontractor voluntarily withdraws from the project and provides the Airport written notice of its withdrawal;
8. The listed DBE is ineligible to receive DBE credit for the type of work required;
9. A DBE owner dies or becomes disabled with the result that the listed DBE contractor is unable to complete its work on the contract;

10. Other documented good cause that the Airport has determined compels the termination of the DBE subcontractor. Provided, that good cause does not exist if the prime contractor seeks to terminate a DBE it relied upon to obtain the contract so that the prime contractor can self-perform the work for which the DBE contractor was engaged or so that the prime contractor can substitute another DBE or non-DBE contractor after contract award.

Before transmitting to the **Bangor International Airport** a request to terminate and/or substitute a DBE subcontractor, the prime contractor must give notice in writing to the DBE subcontractor with a copy to the **Bangor International Airport**, of its intent to request to terminate and/or substitute the DBE, and the reason(s) for the request.

The prime contractor must give the DBE five days to respond to the prime contractor's notice and advise the **Bangor International Airport** and the prime contractor of the reasons, if any, why the DBE objects to the proposed termination of its subcontract and why the prime contractor's action should not be approved. If required in a particular case as a matter of public necessity (e.g., safety), a response period shorter than five days may be provided.

In addition to post-award terminations, the provisions of this section apply to pre-award deletions of or substitutions for DBE firms put forward by offerors in negotiated procurements.

Each prime contract will include a provision stating:

> The contractor shall utilize the specific DBEs listed in the contractor's **bid** response to perform the work and supply the materials for which each is listed unless the contractor obtains prior written consent of the **Bangor International Airport** as provided in 49 CFR Part 26, §26.53(f). Unless such consent is provided, the contractor shall not be entitled to any payment for work or material unless it is performed or supplied by the listed DBE.

The **Bangor International Airport** will require a contractor to make good faith efforts to replace a DBE that is terminated or has otherwise failed to complete its work on a contract with another certified DBE. These good faith efforts shall be directed at finding another DBE to perform at least the same amount of work under the contract as the DBE that was terminated, to the extent needed to meet the contract goal that was established for the procurement. The good faith efforts shall be documented by the contractor. If the **Bangor International Airport** requests documentation from the contractor under this provision, the contractor shall submit the documentation within 7 days, which may be extended for an additional 7 days if necessary at the request of the contractor. The **Bangor International Airport** shall provide a written determination to the contractor stating whether or not good faith efforts have been demonstrated.

If the contractor fails or refuses to comply in the time specified, the contracting office/representative of the **Bangor International Airport** may issue an order stopping all or part of payment/work until satisfactory action has been taken. If the contractor still fails to comply, the contracting officer may issue a termination for default proceeding.

Section 26.55 Counting DBE Participation

DBE participation will be counted toward overall and contract goals as provided in §26.55. The participation of a DBE subcontractor will not be counted toward a contractor's final compliance with its DBE obligations on a contract until the amount being counted has actually been paid to the DBE.

In the case of post-award substitutions or additions, if a firm is not currently certified as a DBE in accordance with the standards of subpart D of this part at the time of the execution of the contract, the firm's participation will not be counted toward any DBE goals, except as provided for in §26.87(j).

Pursuant to Section 150 of the FAA Reauthorization Act of 2018, firms that exceed the business size standard in §26.65(b) will remain eligible for DBE certification and credit on FAA-funded projects as long as they do not exceed the small business size standard, as adjusted by the United Stated Small Business Administration, for the NAICS code(s) in which they are certified.

SUBPART D – CERTIFICATION STANDARDS

Section 26.61 – 26.73 Certification Process

The **Bangor International Airport** is a non-certifying member of the Maine Unified Certification Program (UCP). Maine UCP will use the certification standards of Subpart D of Part 26 to determine the eligibility of firms to participate as DBEs in DOT-assisted contracts. To be certified as a DBE, a firm must meet all certification eligibility standards. Certifying Maine UCP members make all certification decisions based on the facts as a whole.

For information about the certification process or to apply for certification, firms should call, write, or browse to the following:

Maine Department of Transportation
Attn: Mary Bryant
Civil Rights Office
#16 State House Station
24 Child Street
Augusta, ME 04333-0016
Tel. 207-624-3056 or at the following web site:
http://www.maine.gov/mdot/civilrights/dbe

The Uniform Certification Application form and documentation requirements are found in Attachment 9 to this program.

SUBPART E – CERTIFICATION PROCEDURES

Section 26.81 Unified Certification Programs

The **Bangor International Airport** is not a certifying agency. Sections 26.83 through 26.89 have been omitted from this program.

Section 26.91 Actions Following DOT Certification Appeal Decisions

If the **Bangor International Airport** is a certifier to which a DOT determination under Section 26.89 is applicable, we will take any and all required action(s) pursuant to Section 26.91.

SUBPART F – COMPLIANCE AND ENFORCEMENT

Section 26.101 Compliance Procedures Applicable to the Bangor International Airport

The **Bangor International Airport** understands that if it fails to comply with any requirement of this part, the **Bangor International Airport** may be subject to formal enforcement action under §26.103 or §26.105 or appropriate program sanctions by the concerned operating administration, such as the suspension or termination of Federal funds, or refusal to approve projects, grants or contracts until deficiencies are remedied. Program sanctions may include, in the case of the FHWA program, actions provided for under 23 CFR 1.36; in the case of the FAA program, actions consistent with 49 U.S.C.

47106(d), 47111(d), and 47122; and in the case of the FTA program, any actions permitted under 49 U.S.C. chapter 53 or applicable FTA program requirements.

Bangor International Airport understands that, as provided in statute, it will not be subject to compliance actions or sanctions for failing to carry out any requirement of this part because it has been prevented from complying because a Federal court has issued a final order in which the court found that the requirement is unconstitutional.

Section 26.103 What Enforcement Actions Apply in FHWA and FTA Programs

The provisions of this section apply to enforcement actions under FHWA and FTA programs. ONLY paragraph (2) of this section is also applicable in FAA programs.

Noncompliance complaints. Any person who believes that a recipient has failed to comply with its obligations under this part may file a written complaint with the concerned operating administration's Office of Civil Rights. If you want to file a complaint, you must do so no later than 180 days after the date of the alleged violation or the date on which you learned of a continuing course of conduct in violation of this part. In response to your written request, the Office of Civil Rights may extend the time for filing in the interest of justice, specifying in writing the reason for so doing. The Office of Civil Rights may protect the confidentiality of your identity as provided in Section 26.109(b). Complaints under this part are limited to allegations of violation of the provisions of this part.

Compliance reviews. The concerned operating administration may review the recipient's compliance with this part at any time, including reviews of paperwork and on-site reviews, as appropriate. The Office of Civil Rights may direct the operating administration to initiate a compliance review based on complaints received.

Reasonable cause notice. If it appears, from the investigation of a complaint or the results of a compliance review, that the Airport is in noncompliance with this part, the appropriate DOT office will promptly send the Airport, return receipt requested, a written notice advising that there is reasonable cause to find the Airport in noncompliance. The notice states the reasons for this finding and directs the Airport to reply within 30 days concerning whether you wish to begin conciliation.

Conciliation.

(1) If the **Bangor International Airport** requests conciliation, the appropriate DOT office shall pursue conciliation for at least 30, but not more than 120, days from the date of your request. The appropriate DOT office may extend the conciliation period for up to 30 days for good cause, consistent with applicable statutes.

(2) If the **Bangor International Airport** and the appropriate DOT office sign a conciliation agreement, then the matter is regarded as closed and the Airport is regarded as complying. The conciliation agreement sets forth the measures the Airport has taken or will take to ensure compliance. While a conciliation agreement is in effect, the Airport remains eligible for FHWA or FTA financial assistance.

(3) The concerned operating administration shall monitor your implementation of the conciliation agreement and ensure that its terms are complied with. If the **Bangor International Airport** fails to carry out the terms of a conciliation agreement, the **Bangor International Airport** is in noncompliance.

(4) If the **Bangor International Airport** does not request conciliation, or a conciliation agreement is not signed within the time provided in paragraph (1) of this section, then enforcement proceedings begin.

Enforcement actions.

(1) Enforcement actions are taken as provided in this subpart.

(2) Applicable findings in enforcement proceedings are binding on all DOT offices.

Section 26.105 Enforcement Actions Apply in FAA Programs

Compliance with all requirements of this part by airport sponsors and other recipients of FAA financial assistance is enforced through the procedures of Title 49 of the United States Code, including 49 U.S.C. 47106(d), 47111(d), and 47122, and regulations implementing them.

The provisions of Section 26.103 paragraph (2) and this section apply to enforcement actions in FAA programs.

Any person who knows of a violation of this part by a recipient of FAA funds may file a complaint under 14 CFR part 16 with the Federal Aviation Administration Office of Chief Counsel.

Section 26.107 Enforcement Actions Applicable to Participating Firms

If a firm that does not meet the eligibility criteria of subpart D of this part attempts to participate in a DOT-assisted program as a DBE on the basis of false, fraudulent, or deceitful statements or representations or under circumstances indicating a serious lack of business integrity or honesty, the Department may initiate suspension or debarment proceedings against the firm under 2 CFR parts 180 and 1200.

If a firm, in order to meet DBE contract goals or other DBE program requirements, uses or attempts to use, on the basis of false, fraudulent or deceitful statements or representations or under circumstances indicating a serious lack of business integrity or honesty, another firm that does not meet the eligibility criteria of subpart D of this part, the Department may initiate suspension or debarment proceedings against you under 2 CFR parts 180 and 1200.

In a suspension or debarment proceeding brought under paragraph (a) or (b) of this section, the concerned operating administration may consider the fact that a purported DBE has been certified by a recipient. Such certification does not preclude the Department from determining that the purported DBE, or another firm that has used or attempted to use it to meet DBE goals, should be suspended or debarred.

The Department may take enforcement action under 49 CFR Part 31, Program Fraud and Civil Remedies, against any participant in the DBE program whose conduct is subject to such action under 49 CFR part 31.

The Department may refer to the Department of Justice, for prosecution under 18 U.S.C. 1001 or other applicable provisions of law, any person who makes a false or fraudulent statement in connection with participation of a DBE in any DOT-assisted program or otherwise violates applicable Federal statutes.

Section 26.109 Information, Confidentiality, Cooperation

In responding to requests for information concerning any aspect of the DBE program, the Department complies with provisions of the Federal Freedom of Information and Privacy Acts (5 U.S.C. 552 and 552a). The Department may make available to the public any information concerning the DBE program release of which is not prohibited by Federal law.

Notwithstanding any provision of Federal or state law, information that may reasonably be construed as confidential business information will not be released to any third party without the written consent of

the firm that submitted the information, including applications for DBE certification and supporting information. However, this information will be transmitted to DOT in any certification appeal proceeding under §26.89 or to any other state to which the individual's firm has applied for certification under §26.85.

All participants in the Department's DBE program (including, but not limited to, recipients, DBE firms and applicants for DBE certification, complainants and appellants, and contractors using DBE firms to meet contract goals) are required to cooperate fully and promptly with DOT and recipient compliance reviews, certification reviews, investigations, and other requests for information. Failure to do so shall be a ground for appropriate action against the party involved (e.g., with respect to recipients, a finding of noncompliance; with respect to DBE firms, denial of certification or removal of eligibility and/or suspension and debarment; with respect to a complainant or appellant, dismissal of the complaint or appeal; with respect to a contractor which uses DBE firms to meet goals, findings of non-responsibility for future contracts and/or suspension and debarment).

The **Bangor International Airport,** contractor, or any other participant in the program will not intimidate, threaten, coerce, or discriminate against any individual or firm for the purpose of interfering with any right or privilege secured by this part or because the individual or firm has made a complaint, testified, assisted, or participated in any manner in an investigation, proceeding, or hearing under this part. **Bangor International Airport** understands that it is in noncompliance with Part 26 if it violates this prohibition

End of Plan after Attachments

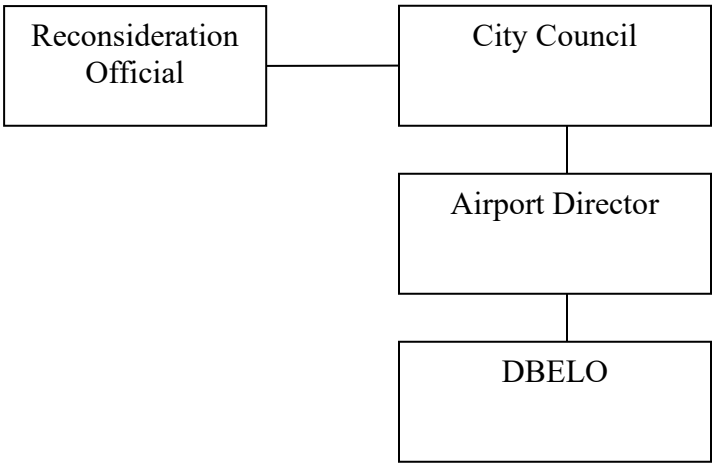
Attachment 1

Regulations: 49 CFR Part 26

Available by internet connection at the following:
https://www.ecfr.gov/cgi-bin/text-idx?tpl=/ecfrbrowse/Title49/49cfr26_main_02.tpl

Attachment 2

Organizational Chart



Attachment 3
DBE Questionnaire

Bangor International Airport
Bangor, ME

As part of a recent bid form received by the City of Bangor, your firm was identified as a Disadvantaged Business Enterprise (DBE) who submitted a bid or provided a price quote to another firm(s) submitting bids on a federally funded project. Per the requirements of 49 CFR Part 26, "Participation by Disadvantaged Business Enterprises in DOT Programs", the City of Bangor has established a DBE plan. This plan is updated every three years to reflect the Airport's upcoming projects and the availability of qualified DBE firms that are ready, able and willing to participate in federally funded projects at the Bangor International Airport. The information below will assist the Airport in maintaining an accurate DBE directory of firms bidding or are interested in the opportunity to participate in these projects.

Please provide the following information:

Name of Firm:_____

Address:_____

_____

Contact Person:_____

Phone:_____

Fax:_____

DBE Certifications (include expiration date):_____

Type of Work Done by Firm:_____

Age of Firm:_____ Annual Gross Revenues of Firm:_____

Bonding Capacities of Firm: Max. Single Contract:_____

Max. Aggregate:_____

Please remit this information to:

DBE Liaison Officer
Bangor International Airport
287 Godfrey Boulevard
Bangor, Maine 04401

Your participation in this effort is appreciated and will help establish realistic DBE goals for future projects at the Bangor International Airport.

Attachment 4

Section 26.45: Overall Goal Calculation

Amount of Goal

1. The City of Bangor, ME's (the City) overall goal for Federal Fiscal Year (FFY) 2024-2026 is the following: 2.63% of the Federal Financial assistance expended in FAA-assisted contracts.

2. The federal dollar amount of FAA-assisted contracts that the City expects to award during FFY 2024-2026 is approximately $85,448,633.80. The awards are anticipated to be in airport related engineering services, heavy civil construction projects, airfield electrical, commercial building construction, topographic surveying, and construction materials testing. This means that the City has set a goal of expending approximately $2,248,439.51 ($85,448,633.80 x 2.63%) of federal dollars with DBE firms during this period.

Methodology used to Calculate Overall DBE Goal

The City has established the overall DBE goal in accordance with the 2-Step process as specified in 49 CFR Part 26.45. The first step determined the relative availability of DBEs in the market area, the "base figure". The second step is to adjust the "base figure" percentage from Step 1 so that it reflects, as accurately as possible, the DBE participation expected in the absence of discrimination based on past participation and local data.

Step 1: 26.45(c) DBE Base Figure Calculation

Based on a review of the FFY 2024-2026 projects, it is anticipated that the program will attract firms within the market area that perform work under the North American Industry Classification System (NAICS) codes as indicated in the following table.

Table 1 – Capital Improvement Plan (CIP) Projects with Industry Code Descriptions

Year	CIP Project[1]	Industry Code Descriptions – NAICS Codes[2]
2024	2024 Reconstruct Runway 15-33 (6368 feet ~ 4139' eligible+2229' ineligible)	Highway, street, and bridge construction (237310) Electrical Contractors and Other Wiring Installation Contractors (238210) Engineering Services (541330) Testing laboratories (541380)
2024	2024 Reconstruct Runway 15-33 (3385 feet~ 2200 eligible + 1185 ineligible)	Highway, street, and bridge construction (237310) Electrical Contractors and Other Wiring Installation Contractors (238210) Engineering Services (541330) Testing laboratories (541380)
2025	2025 Reconstruct Runway 15-33 (1023 feet~665 eligible+358 ineligible)	Highway, street, and bridge construction (237310) Electrical Contractors and Other Wiring Installation Contractors (238210) Engineering Services (541330) Testing laboratories (541380)
2025	2025 Reconstruct Runway 15-33 (663 feet~431 eligible+232 ineligible)	Highway, street, and bridge construction (237310) Electrical Contractors and Other Wiring Installation Contractors (238210) Engineering Services (541330) Testing laboratories (541380)
2025	Taxiway A (50) - Proper (Limits Taxiway A @ Int with Taxiway K)	Highway, street, and bridge construction (237310) Electrical Contractors and Other Wiring Installation Contractors (238210) Engineering Services (541330) Testing laboratories (541380) Surveying and mapping (except geophysical) services (541370)
2025	BGR Gate 6 Connector Expansion (including PBB - 7)	Engineering Services (541330) Electrical Contractors and Other Wiring Installation Contractors (238210) Commercial and Industrial Building Construction (236220) Security System Services (except Locksmiths) (561621) Water and Sewer Line and Related Structures Construction (237110)
2025	Energy Master Planning - Stage 1 (Evaluation, Planning, Recommendation & Conceptual Estimate)	Engineering Services (541330)

2026	Taxiway A (40) - Proper (Limits Taxiway A at De-icing Ramp)	Highway, street, and bridge construction (237310) Electrical Contractors and Other Wiring Installation Contractors (238210) Engineering Services (541330) Testing laboratories (541380) Surveying and mapping (except geophysical) services (541370)
2026	Taxiway A (70) - Proper (Limits Taxiway K to Taxiway L) w/ (40 @ L)	Highway, street, and bridge construction (237310) Electrical Contractors and Other Wiring Installation Contractors (238210) Engineering Services (541330) Testing laboratories (541380) Surveying and mapping (except geophysical) services (541370)
2026	Taxiway M (20) - Proper (Limits Taxiway A to Runway 15-33)	Highway, street, and bridge construction (237310) Electrical Contractors and Other Wiring Installation Contractors (238210) Engineering Services (541330) Testing laboratories (541380) Surveying and mapping (except geophysical) services (541370)
2026	Taxiway A (100) - Proper (Limits Taxiway A Just Prior to Curve to Access Runway 15 Approach) & Taxiway A (110) - Proper (Limits Taxiway A at Curve to Access Runway 15 Approach)	Highway, street, and bridge construction (237310) Electrical Contractors and Other Wiring Installation Contractors (238210) Engineering Services (541330) Testing laboratories (541380) Surveying and mapping (except geophysical) services (541370)
2026	Energy Master Implementation - Stage 2 Grant (Final Design / Construction)	Engineering Services (541330) Electrical Contractors and Other Wiring Installation Contractors (238210) Commercial and Industrial Building Construction (236220)

Source: [1] Airport Capital Improvement Plan (9/19/2019); [2] North American Industry Classification System (NAICS), U.S. Census Bureau.

Market Area

The market area is considered the State of Maine. Based on past contracts, the majority of contractors and subcontractors have been located in Maine. Only firms that have a principal place of business located within the market area were used in determining the base figure.

Weighted Goal Calculations

Step 1A – Group NAICS Codes

In this step, similar NAICS codes from Table 1 are grouped so that only one NAICS code is represented in Table 2 (below). The NAICS codes are presented in column 1 of Table 2.

Step 1B – Calculate the % of Work for each NAICS code

In this step, the dollar value of each NAICS code is estimated over the 3-year goal calculation period. This value is then converted into a "% of Work" based on the total 3-year funding. This is calculated as follows: the dollar value of the individual NAICS code is divided by the total estimated cost of all the projects in the 3-year goal calculation period. For example, if the Engineering Services cost is estimated at $2,293,136.80 and the total of all the projects in the 3-year goal calculation period are estimated value as $44,587,736.00 . Thus, the "% of Work" value for Engineering Services is $2,293,136.80/ $44,587,736 x 100% = 5.14%. The values are provided in column 2 of Table 2.

Step 1C – Determine the number of DBE firms

In this step, the number of DBE firms located within the market area with services that relate to the projects listed are identified in the MEDOT Disadvantaged Business Enterprise Directory. http://www.maine.gov/mdot/civilrights/dbe

The number of identified DBE firms is summed by NAICS code. The values are provided in column 3 of the Table 2.

Step 1D – Determine the number of Businesses

In this step, the numbers of related businesses (DBE and non-DBE) located in the market area are determined from the latest NAICS database provided by the U.S. Census Bureau. https://www.census.gov/programs-surveys/cbp/data.html The values are provided in column 4 of the Table 2.

Step 1E – Calculate the % Contribution of each NAICS code

In this step, the % contribution for each NAICS code is calculated. The calculation is weighted based on the "% of Work", the number of DBE firms by NAICS code and the number of Businesses by NAICS code. An example of the weighting calculation is as follows:

Ex.: % contribution of each NAICS code = % of Work x (ME DBE Firms/ ME Businesses) x 100%
= Column (2) x (Column 3/Column 4) x 100%
= 9.75% x (3/80) x 100% = 0.37%

Each NAICS code contribution is calculated and summed to determine the overall goal. The values are provided in column 5 of the Table 2. Therefore, the FFY 2024-2026 "base figure" goal is 5.85%.

Table 2 – Weighted Average Goal Calculation

(1)	(2)	(3)	(4)	(5)
NAICS Code[1]	% of Work	DBE Firms[2]	Businesses	% Contribution (Rounded)
Commercial and Industrial Building Construction (236220)	27.78%	3	140	0.60%
Electrical contractors and other wiring installation contractors (238210)	22.26%	0	629	0.00%
Engineering services (541330)	7.77%	6	307	0.15%
Highway, street, and bridge construction (237310)	37.76%	9	67	5.07%
Surveying and mapping (except geophysical) services (541370)	0.20%	2	81	0.00%
Security Systems Services (except Locksmiths) (561621)	0.37%	0	24	0.00%
Testing laboratories (541380)	2.95%	0	39	0.00%
Water and Sewer Line and Related Structures Construction (237110)	0.92%	2	65	0.03%
			Base Goal (Rounded)	5.85%

Source: [1] County Business Patterns (NAICS) U.S. Census Bureau; [2] MEDOT Disadvantaged Business Enterprise Directory

Step 2: 26.45(d) Base Figure Adjustment

After calculating a "base figure" of the relative availability of DBEs within the market area, evidence was examined to determine what adjustment, if any, was needed to the "base figure" in order to arrive at the overall goal.

The first evidence for basis of adjustment considers the current capacity of DBEs to perform work, as measured by the volume of work DBEs have performed in recent years (ref. 26.45(d)(1)(i)). DBE firms have had equal opportunity to perform work on airport projects in recent years through normal contracting procedures. The volume of work performed in recent years has been neither excessively high nor low in comparison to all the work conducted. Based on this evidence, no adjustment to the "base figure" has been made.
as been made.
s been made.

The second evidence for basis of adjustment considers any existing disparity studies within the airport's jurisdiction (ref. 26.45(d)(1)(ii)). The MEDOT Director of Civil Rights Office was contacted regarding evidence of existing disparity studies. MEDOT indicated there are no relevant disparity studies in the State of Maine. Based on this evidence, no adjustment to the "base figure" has been made.

The third evidence that must be evaluated is the evidence from related fields that affect the opportunities for DBEs to form, grow and compete (ref. 26.45(d)(2)). This evaluation is conducted in 2 parts.

1) This includes evaluating statistical disparity in the abilities of DBEs to get the financing, bonding and insurance required perform work (ref. 26.45(d)(2)(i)). As noted previously, the MEDOT Director of Civil Rights Office was contacted and could provide no evidence of disparity studies. Based on this evidence, no adjustment to the "base figure" has been made.

2) Maine Department of Transportation, the Associated Constructors of Maine Inc., the National Association of Women in Construction, and the Maine Better Transportation Association were consulted in writing to seek feedback on the goal methodology and the evidence of data related to opportunities for DBE's to perform work in ME. The Airport received no feedback from this written consultation. {pending possible future reply} Based on this evidence, no adjustment to the "base figure" has been made.

Ultimately, two data points were utilized to determine the base figure adjustment. The first data point is the historic DBE accomplishments at the Bangor International Airport. The following table displays actual DBE participation on on-going contracts for the last three years on record. The data indicates that the Airport has an average DBE participation of 1.10% on recent completed projects.

Fiscal Year	Total Dollars Paid	DBE Dollars Paid	%
2020	$2,454,287	$11,199.38	0.46%
2021	$3,808,061	$0	0.00%
2022	$1,986,661	$79,619.27	4.01%
Total DBE Participation	$8,249,009	$90,818.65	1.10%

The second data point used in the base figure adjustment is the DBE goal set forth by MaineDOT for Federally Assisted Aviation Projects for federal fiscal years (FFY) 2024-2026. MaineDOT has determined that for FFY 2024-2026 the overall annual DBE attainment on FAA funded projects is 0.94%.

To determine the overall goal, the base figure determined in Step 1 (5.85%) and the two data points from Step 2 (historic participation of 1.10% and MaineDOT FFY 24-26 goal of 0.94%) were averaged together to arrive at the total overall DBE goal of 2.63%. By using this methodology, the adjusted goal will accurately reflect the

highest DBE participation within the market area that can be achieved for the type of work being awarded during this three-year period.

Public Participation:

The following notice will be posted on the Bangor International Airport website.

PUBLIC NOTICE

The City of Bangor hereby announces its federal fiscal years 2024-2026 goal of 2.63% for Disadvantaged Business Enterprise (DBE) related to FAA-assisted contracts for airport engineering, civil and building construction. The proposed goal and rationale is available for inspection between 8:00 a.m. and 3:00 p.m., Monday through Friday at the 3rd floor Administrative Office of the Bangor International Airport, 287 Godfrey Boulevard, Bangor, ME 04401 or on the City of Bangor's website http://www.bangormaine.gov/ for 30 days from the date of this publication.

The City will hold a teleconference open to the public to discuss the methodology used to establish the goal. The call will be held on **Thursday, September 14th, 2023 at 11AM**. To obtain the call number and conference call code please contact Ms. Natalie Pavelock at natalie.pavelock@jacobs.com, prior to the date and time of the call.

Comments on the DBE goal will be accepted for 45 days from the date of availability of this notice and can be sent to the following:

Ms. Beth Martin
Manager of Airfield Operations
Bangor International Airport
287 Godfrey Boulevard
Bangor, ME 04401
bmartin@flybangor.com

Consultation

The Airport consulted in writing with the agencies listed in Section 26.45 of the plan. The agencies provided no comments.

The Airport made available a teleconference open to the public to discuss the methodology used to establish the goal and seek further input. Interested participants included: *{There were no participants.}*

Comments from the Public Participation and Consultation

The public comment period will end 45 days after the public notice was issued. ***{*** *No responses were received.* ***}***

Attachment 5

Section 26.51: Breakout of Estimated Race-Neutral & Race Conscious Participation

The City will attempt to meet the maximum feasible portion of its overall goal by using race-neutral means of facilitating DBE participation. The City uses the following race-neutral means to increase DBE participation:

1. Arranging solicitations, times for the presentation of bids, specifications, and delivery schedules in ways that facilitate DBE participation (e.g., encouraging prime contractors to subcontract portions of work that they might otherwise perform with their own forces);
2. Carrying out information and communications programs on contracting procedures and specific contract opportunities (e.g., ensuring the inclusion of DBEs on recipient mailing lists for bidders; ensuring the dissemination to bidders on prime contracts of lists of potential subcontractors);
3. Ensuring distribution of the MEDOT DBE directory, through print and electronic means, to the widest feasible universe of potential prime contractors; and
4. Assisting DBEs, and other small businesses, to develop their capability to utilize emerging technology and conduct business through electronic media.
5. Ensuring the DBE goals are published in all bid and contract documents.

Historically, DBE goals for airport projects in Maine have only been met through implementing contract goals. In order to ensure that our DBE Program will be narrowly tailored to overcome the effects of discrimination, the City anticipates using contract goals. The City will monitor the DBE participation and adjust contract goals as required.

In meeting the overall DBE goal of 2.63%, the City anticipates it will obtain 0% from race-neutral participation and 2.63% through race conscious measures.

The City will also adjust the estimated breakout of race-neutral and race-conscious participation as needed to reflect actual DBE participation (see 26.51(f)) and the City will track and report race-neutral and race conscious participation separately. For reporting purposes, race-neutral DBE participation includes, but is not necessarily limited to, the following: DBE participation through a prime contract that a DBE obtains through customary competitive procurement procedures; DBE participation through a subcontract on a prime contract that does not carry DBE goal; DBE participation on a prime contract exceeding a contract goal; and DBE participation through a subcontract from a prime contractor that did not consider a firm's DBE status in making the award.

The City will maintain data separately on DBE achievements in those contracts with and without contract goals, respectively.

Attachment 6
UCP Agreement between City of Bangor and the State of Maine

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
16 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0016

ANGUS S. KING, JR.
GOVERNOR

JOHN G. MELROSE
COMMISSIONER

April 17, 2002

US Department of Transportation
Office of the General Counsel
Uniform Certification Program
Attention: Robert Ashby C-50
Room 10428
400 Seventh Street, SW
Washington, DC 20590

Mr. Ashby:

Please find enclosed copies of the various UCP Agreements entered between Maine Department of Transportation and FTA, FAA, FRA (via Northern New England Passenger Rail Authority, the Metropolitan/ County or Regional Planning Organizations, Cities or Municipalities with jurisdictional authority for aviation facilities, and the Maine Department of Environmental Protection.

These agreements serve to formalize informal relationships with these agencies and the Maine Department of Transportation regarding the certification of Disadvantaged Business Enterprises. As you may know, the Maine Department of Transportation **is** the only certifying entity in Maine, and as such these agreements while required by 49 CFR Part 26 § 81 simply reaffirm many years of professional relationships with these entities.

We have chosen to enter into separate agreements with each grantee and they are provided as an enclosure to this letter.

Inquiries may be directed to me at 207-624-3066.

Sincerely,

Penny Plourde, Manager
Small Business Programs

Encs
Cc: Maine Division FHWA

PRINTED ON RECYCLED PAPER

THE MAINE DEPARTMENT OF TRANSPORTATION IS AN AFFIRMATIVE ACTION - EQUAL OPPORTUNITY EMPLOYER

AGREEMENT

Between the

MAINE DEPARTMENT OF TRANSPORTATION

OFFICE OF HUMAN RESOURCES

And

City of Bangor, Maine

This Agreement is made this 10th day of April, 2002, by and between the **State of Maine**, through its **Department of Transportation (MDOT)**, with an address of 16 State House Station, Augusta, Maine, and the City of Bangor, with an address of 73 Harlow Street Bangor, Maine.

I. AGREEMENT

MDOT and the named party hereby agrees as follows:

1. The named party agrees that as a recipient of USDOT financial assistance it will cooperate fully with the Maine Department of Transportation in the certification of Disadvantaged Business Enterprises.

2. The named party agrees it shall utilize the MDOT Disadvantaged Business Enterprise Certification program.

3. The named party agrees to refer potential applicants for DBE Certification to MDOT.

4. The named party agrees to honor the decisions made by MDOT with respect to certification decisions made in accordance with 49 CFR Parts 23 and 26 Subpart E Certification Procedures.

5. MDOT will accept, review, and make determinations about DBE Certification for those entities referred to it by the named party.

II TERMS

This Agreement remains in place indefinitely.

SEEN AND AGREED TO BY:

MAINE DEPARTMENT OF TRANSPORTATION

Penny Plourde

By: Penny Plourde Manager, Small Business Programs

Purchasing Agent

By: David N. Pellegrino Title

Attachment 7

Fostering Small Business Participation Form

Fostering Small Business Participation	
Sponsor's Name:	
Airport Name:	
City, State:	
AIP Number:	
Federal Fiscal Year:	

In accordance with Section 26.39 the following detailed list shall be completed by Prime Contractor(s) for Construction Work Items as well as by Prime Contractor(s) for Professional Services Work Items. Note: The firms listed below may or may not be certified DBEs.

Small Business Firms to be Utilized (Name, Address, Phone)		Work to be Performed	Total Estimated Cost of Work
Name			
Address			
City, St, Zip			
Telephone			
Is the firm a Certified DBE?	☐ **Yes** ☐ **No**		

Name			
Address			
City, St, Zip			
Telephone			
Is the firm a Certified DBE?	☐ **Yes** ☐ **No**		

Name			
Address			
City, St, Zip			
Telephone			
Is the firm a Certified DBE?	☐ **Yes** ☐ **No**		

Name			
Address			
City, St, Zip			
Telephone			
Is the firm a Certified DBE?	☐ **Yes** ☐ **No**		

Name			
Address			
City, St, Zip			
Telephone			
Is the firm a Certified DBE?	☐ **Yes** ☐ **No**		

Name			
Address			
City, St, Zip			
Telephone			
Is the firm a Certified DBE?	☐ **Yes** ☐ **No**		

(Duplicate form as necessary.)

The following notation is for Sponsor Use Only:

Accepted by: _____ **Date:** _____

Attachment 8

Bidders List Collection Form

Project Title: _____

_____

_____

Bid Due Date: _____

Location: _____

Pre-Bid Meeting Date: _____

Firm Name	Street Address	Street Address (Line 2)	City	State	ZIP Code	DBE or Non-DBE Status	NAICS Code(s) of Scope(s) Bid	Race of Majority Owner	Gender of Majority Owner	Age of Firm	Annual Gross Receipts

Attachment 9
DBE Certification Application Form and Directory

MaineDOT is the certifying agency. The forms required to initiate the DBE Certification Process are available on the State of Maine's Department of Transportation website:

https://www.maine.gov/mdot/civilrights/dbe/

Both In-State and Out-Of-State applications are located at the site above.

MaineDOT In-State DBE documents required for certification:

- Interstate Declaration of Eligibility
- DBE Application
- Personal Net Worth Statement
- Personal Financial Statement
- Supporting Documents Checklist

MaineDOT Out-Of-State DBE documents required for certification:

- Interstate Certification Request Form
- Interstate Declaration of Eligibility

MaineDOT updates the D/WBE Directory of Businesses daily.

https://www.maine.gov/mdot/civilrights/docs/dbe/2022/WeeklyDBEVendorList.pdf

Point of contact for application forms and instructions is listed below:

Maine Department of Transportation
Attn: Mary Bryant
Civil Rights Office
#16 State House Station
24 Child Street
Augusta, ME 04333-0016
Telephone: (207) 624-3056
E-mail: mary.bryant@maine.gov

Attachment 10
Demonstration of Good Faith Efforts

Forms 1, 2, and 3 shall be provided as part of the solicitation documents.

These forms are NOT for use in soliciting for Design-Build contracts. Design-Build solicitations require respondents to provide a DBE Open-Ended Performance Plan in initial responses.

FORM 1: DISADVANTAGED BUSINESS ENTERPRISE (DBE) UTILIZATION

The undersigned bidder/offeror has satisfied the requirements of the bid specification in the following manner:

□ Bidder/offeror has met the DBE contract goal
The bidder/offeror is committed to a minimum of ____ % DBE utilization on this contract.

□ Bidder/offeror has not met the DBE contract goal
The bidder/offeror is committed to a minimum of ____% DBE utilization on this contract and has submitted documentation demonstrating good faith efforts.

Legal name of bidder/offeror's firm: _____

Bidder/Offeror Representative:

_____
Name & Title

_____ _____
Signature Date

FORM 2: LETTER OF INTENT

Note: The authorized representative (AR) named below must be an individual vested with the authority to make contracting decisions on behalf of the firm.

Name of bidder/offeror's firm: _____

Name & title of firm's AR: _____

Phone: _____ Email: _____

Name of DBE firm: _____

Name & title of DBE firm's AR: _____

Address: _____

City: _____ State: _____ Zip: _____

Phone: _____ Email: _____

Work to be performed by DBE firm:

Description of Work	*NAICS*	*Dollar Amount / %**	*Manufacturer/Regular Dealer/Distributor/Broker***

**Percentage is to be used only in negotiated procurements*

***For DBE suppliers only, state how the DBE will perform. For dealer/distributor/broker, Form 3 must be included.*

The undersigned bidder/offeror is committed to utilizing the above-named DBE firm for the work described above. The total expected dollar value of this work is $ _____. The bidder/offeror understands that if it is awarded the contract/agreement resulting from this procurement, it must enter into a subcontract with the DBE firm identified above that is representative of the type and amount of work listed. Bidder/offeror understands that upon submitting this form with its bid/offer, it may not substitute or terminate the DBE listed above without following the procedures of 49 CFR Part 26, §26.53.

_____ Date: _____

Signature of Bidder/Offeror's Authorized Representative

The undersigned DBE affirms that it is ready, willing, and able to perform the amount and type of work as described above, and is properly certified to be counted for DBE participation therefore.

_____ Date: _____

Signature of DBE's Authorized Representative

If the bidder/offeror does not receive award of the prime contract, all representations in this Letter of Intent shall be null and void.

Submit this page for each DBE subcontractor.

Form 3: DBE Regular Dealer/Distributor Affirmation Form

OMB Approval Pending 04/17/2024

U.S. Department of Transportation

DBE Regular Dealer/Distributor Affirmation Form

Bidder Name:

Contract Name/Number:

Sections 26.53(c)(1) of Title 49 Code of Federal Regulations requires recipients to make a preliminary counting determination for each DBE listed as a regular dealer or distributor to assess its eligibility for 60 or 40 percent credit, respectively, of the cost of materials and supplies based on its demonstrated capacity and intent to perform as a regular dealer or distributor, as defined in section 26.55(e)(2)(iv)(A),(B),(C), and (3) under the contract at issue. The regulation requires the recipient's preliminary determination to be made based on the DBE's written responses to relevant questions and its affirmation that its subsequent performance of a commercially useful function will be consistent with the preliminary counting of such participation. The U.S. Department of Transportation is providing this form as a tool for recipients, prime contractors, regular dealers, and distributors to use to carry out their respective responsibilities under this regulation. The form may be used by each DBE supplier whose participation is submitted by a bidder for regular dealer or distributor credit on a federally-assisted contract with a DBE participation goal. The form may also be used by prime contractors in connection with DBE regular dealer or distributor participation submitted after a contract has been awarded provided such participation is subject to the recipient's prior evaluation and approval. If this form is used, it should be accompanied by the bidder's commitment, contract, or purchase order showing the materials the DBE regular dealer or distributor is supplying. Use of this tool is not mandatory. If a recipient chooses a different method for complying with Section 26.53(c)(1), it must include that method in its DBE Program Plan.
DISCLAIMER: This form has not yet received OMB/PRA approval and is subject to change. We are making it available for your voluntary use.

DBE Name:

Total Subcontract/Purchase Order Amount:

Authorized DBE Representative (Name and Title):

NAICS Code(s) Related to the Items to be Sold/Leased:

1. Will **all** items sold or leased be provided from the on-hand inventory at your establishment? ☐ **YES** ☐ **NO**

   (If "YES," you have indicated that your performance will satisfy the regular dealer requirements and may be counted at 60%. STOP here. Read and sign the affirmation below. If "NO" Continue.)

   a) Are you selling bulk items (e.g., petroleum products, steel, concrete, concrete products, sand, gravel, asphalt, etc.) or items not typically stocked due to their unique characterisics (aka specialty items)?
   ☐ **YES** ☐ **NO** **(If "YES," Go to Question 2. If "NO" Continue.)**

   b) Will at least 51% of the items you are selling be provided from the inventory maintained at your establishment, and will the minor quantities of items delivered from and by other sources be of the general character as those provided from your inventory?
   ☐ **YES** ☐ **NO*** **(If "YES," you have indicated that your performance will satisfy the regular dealer requirements and may be counted at 60%. STOP here. Read and sign the affirmation below.**

   ***If 1.,1.a), and 1. b) above are "NO," your performance on the whole will not satisfy the regular dealer requirements; therefore, only the value of items to be sold or leased from inventory can be counted at 60%. (Go to Question 3. to determine if the items delivered from and by other sources are eligible for Distributor credit.)**

2. Will you deliver all bulk or specialty items using distribution equipment you own (or under a long-term lease) and operate?
   ☐ **YES** ☐ **NO[1]**

   (If "YES," you have indicated that your performance will satisfy the requirements for a regular dealer of bulk items and may be counted at 60%. STOP here. Read and sign the affirmation below.)

   [1] If "NO," your performance will not satisfy the requirements for a regular dealer of bulk items; the value of items to be sold or leased cannot be counted at 60%. (Go to Question 3.)

3. Will the written terms of your purchase order or bill of lading from a third party transfer responsibility, including risk for loss or damage, to your company at the point of origin (e.g. a manufacture's facility) ? ☐ **YES[2]** ☐ **NO[3]**

   a) Will you be using sources **other than** the manufacturer (or other seller) to deliver or arrange delivery of the items sold or leased ? ☐ **YES[2]** ☐ **NO[3]**

[2] If your responses to 3 and 3.a) are "YES," you have indicated that your performance will satisfy the requirements of a distributor; therefore, the value of items sold or leased may be counted at 40%.

[3] If you responded "NO" to either 3 or 3.a), counting of your participation is limited to the reasonable cost of fees or commissions charged, including transportation charges for the delivery of materials or supplies; the cost of materials or supplies may not be counted.

I affirm that the information that I provided above is true and correct and that my company's subsequent performance of a commercially useful function will be consistent with the above responses. I further affirm that my company will independently negotiate price, order specified quantities, and pay for the items listed in the bidder's commitment. This includes my company's responsibility for the quality of such items in terms of necessary repairs, exchanges, or processing of any warranty claims for damaged or defective materials.

Printed Name and Signature of DBE Owner/Authorized Representative:

The bidder acknowledges its responsibility for verifying the information provided by the DBE named above and ensuring that the counting of the DBE's participation is accurate. Any shortfall caused by errors in counting are the responsibility of the bidder.

Printed Name and Signature of Bidder's Authorized Representative:

Attachment 11
DBE Monitoring and Enforcement Mechanisms

The **Bangor International Airport** has available several remedies to enforce the DBE requirements contained in its contracts, including, but not limited to, the following:

1. Breach of contract action, pursuant to the terms of the contract, as called out in the FAA Required Contract Provisions – A3 Breach of Contract Terms – 2 CFR Part 200, Appendix II(A).
2. Breach of contract action, pursuant to the terms of the contract, as called out in Section 11.0 General Requirements for Participation by Disadvantaged Business Enterprises (DBE) in Department of Transportation Program – Compliance.

In addition, the Federal government has available several enforcement mechanisms that it may apply to firms participating in the DBE problem, including, but not limited to, the following:

1. Suspension or debarment proceedings pursuant to 49 CFR Part 26
2. Enforcement action pursuant to 49 CFR Part 31
3. Prosecution pursuant to 18 USC 1001.

Attachment 12
Small Business Element Plan

1. Objective/Strategies

Bangor International Airport (BGR) has created a practice to foster small business participation. This practice consists of the follow strategies:

1. Structure contracts to facilitate competition by small business concerns, taking all reasonable steps to eliminate obstacles to their participation, including unnecessary and unjustified bundling of contract requirements that may preclude small business participation in procurements as prime contractors or subcontractors.

2. BGR may unbundle projects or separate large contracts into smaller contracts which may be more suitable for small business participation. BGR will review each FAA-assisted contract to determine whether portions of the project could be unbundled or potentially bid separately. Similarly, BGR will encourage its prime contractors and prime consultants to unbundle contracts to facilitate participation by small businesses.

3. On all prime contracts, BGR will encourage prime contractors to provide subcontracting opportunities of a size that small businesses, including DBEs, can reasonably perform, rather than self-performing all the work involved. Demonstration of good faith efforts must be recorded and submitted for review.

2. Definitions

Disadvantaged business enterprise or *DBE* means a for-profit small business concern:

1. At least 51 percent owned by one or more individuals who are both socially and economically disadvantaged or, in the case of a corporation, in which 51 percent of the stock is owned by one or more such individuals; and

2. Whose management and daily business operations are controlled by one or more of the socially and economically disadvantaged business owners.

Size standard should be consistent with 49 CFR 26.5 and must be no larger than the Small Business Administration's size standards. DBE firms and small firms eligible for the program should be similarly sized to reduce competitive conflict between DBE and non-DBE firms.

3. Verification

The Airport will diligently attempt to minimize fraud and abuse in the small business element of its DBE program by verifying program eligibility of firms. Any verification procedure must allow for participation of all small businesses (relying exclusively on local/state M/WBE certification, SBA 8(a) certification, or other programs that include race/gender/geographical considerations as a condition of the certification is not an acceptable means of verifying eligibility, and is not compliant with the race-neutral requirements of §26.39).]

4. Monitoring/Record Keeping

The Airport will track contract awards to determine baseline conditions. The Airport will determine the number of small businesses typically participating. This will be completed by having Prime Contractor(s) for Construction Work Items and for Professional Services Work Items complete the form entitled, Fostering Small Business Participation Form, located in Attachment 7.

The *Table of Small Business Size Standards matched to North American Industry Classification Codes* as compiled by the U. S. Small Business Administration (found at www.sba.gov) will be used to implement this strategy.

5. Implementation Timeline

The **Bangor International Airport** will implement the Small Business element within 9 months of FAA's approval of this document.

6. Assurance

The **Bangor International Airport** makes the following assurances:

1. The DBE Program, including the Small Business element, is not prohibited by state law;

2. Certified DBEs that meet the size criteria established under the program are presumptively eligible to participate in the program;

3. There are no geographic preferences or limitations imposed on any federally assisted procurement included in the program, so long as the firm is "ready, willing, and able"; and

4. There are no limits on the number of contracts awarded to firms participating in the program but that every effort will be made to avoid creating barriers to the use of new, emerging, or untried businesses.

The following revisions were made in October 2014 (The date which the airport CIP was set):

1. Airport Director changed since original plan. Signed Policy Statement by Airport Director added.
2. Added Section 26.39 Fostering Small Business Participation.
3. Updated Attachment 4 and 5 for FFY 2015-2017.
4. Added Attachment 7 Fostering Small Business Participation Form.
5. Added Attachment 8 Revisions Log
6. Updated web links as required.

The following revisions were made on August 1, 2017
1. 3-year goal update for FY2018-2020
2. The DBELO was updated

The following revisions were made in August 2020
1. Updated to reflect current guidance
2. Updated web links as required
3. 3-year goal update for FY2021-2023

The following revisions were made in August 2023
1. 3-year goal update for FY2024-2026
2. The DBELO was updated

The following revisions were made in October 2024
1. Updated the project list in Table 1 per changes to CIP. The FY2024-2026 project list now includes the Terminal Connector project (as requested by FAA) and other adjusted projects.
2. Updated the list of NAICS codes in Table 2 to reflect the projects listed in Table 1.
3. Revised columns 3 and 4 of Table 2 to include those only in the State of Maine because this is the market area defined in the DBE plan.
4. Goal adjustment methodology was updated to include the MaineDOT DBE goal for Federally Assisted Aviation Projects for FFY 2024-2026.
5. Revised DBE Plan per FAA standard program outlines.
6. Added Attachments 8-12.

END OF DBE PLAN